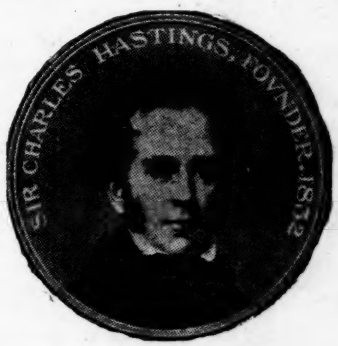
OCT 14 1921
The Medical Lib.

British Medical Journal



The Journal of the British Medical Association.

INCLUDING AN EPITOME OF CURRENT MEDICAL LITERATURE.

WITH SUPPLEMENT.

No. 3170. SATURDAY, OCTOBER 1, 1921. **Price 1/3**

OXFORD MEDICAL PUBLICATIONS

JUST PUBLISHED.

HEART DISEASE AND PREGNANCY

By SIR JAMES MACKENZIE, M.D., F.R.C.P., LL.D., (Edin. and Aberd.) F.R.S., F.R.C.P.I.

Hon. Consulting Physician to His Majesty The King in Scotland; Director of the Institute for Clinical Research, St. Andrews; Consulting Physician to the Victoria Hospital, Burnley, and the London Hospital.

Demy 8vo. Cloth. Illustrated. Price 8s. 6d. net.

HENRY FROWDE AND HODDER & STOUGHTON, THE LANCET Building, 1 & 2, Bedford Street, London, W.C. 2.

SECOND EDITION. 15s. net.

BY

HERBERT J. PATERSON,

C.B.E.; M.C., M.B. (Cantab.), F.R.C.S.

THE

SURGERY OF THE STOMACH.

A Hand-book of Diagnosis and Treatment.

"A masterpiece among monographs."—*The Practitioner.*

JAMES NISBET & Co., London, W.

WISE PARENTHOOD

By MARIE STOPES, D.Sc., Ph.D.

3s. 6d. net (postage extra).

Medical Schools generally have omitted Training on Birth Control so that many Doctors lack the knowledge to advise their Patients.

"WISE PARENTHOOD" is the text-book on the subject and the first scientific discussion of the various practical methods. It should be read by every Medical Man and Woman.

"*It should be read, as it is intended, by married people.*"—THE JOURNAL OF STATE MEDICINE.

At all Booksellers or direct from G. P. PUTNAM'S, 24, Bedford Street, Strand, W.C. 2.

WORKS BY FRANK KIDD, M.B., B.C. (Cantab.), F.R.C.S. (Eng).

COMMON INFECTIONS OF THE KIDNEYS.

With the COLON BACILLUS and ALLIED BACTERIA.

Demy 8vo. Cloth 336 pp. Illustrated in colour and black and white. Price 18/- net.

HENRY FROWDE & HODDER & STOUGHTON, 1 & 2, Bedford Street, London, W.C. 2.

URINARY SURGERY.

A REVIEW.

Demy 8vo. Cloth. 446 pages. 7/6 net.

COMMON DISEASES OF THE MALE URETHRA.

Being a Course of Lectures delivered at the London Hospital.

Demy 8vo. Cloth. 148 pages. 6/- net.

LONGMANS, GREEN & Co., 39, Paternoster Row, London, E.C.4.

J. & A. CHURCHILL'S LIST.

BURNS' BIOPHYSICS. 21s. net.
STARLING'S PHYSIOLOGY. 3rd Ed. 25s. net.
ALCOCK'S PHYSIOLOGY. 7s. 6s. net.
ROBERTS' SYNOPSIS OF PHYSIOLOGY. 15s. net.
SMALL'S TEXT-BOOK OF BOTANY. 25s. net,
LEE & GATENBY'S MICROTOMY. 8th Ed., 28s. net.
COLES' CRITICAL MICROSCOPY. 7s. 6d. net.
MARSHALL'S MICROBIOLOGY. 3rd Ed. 21s. net.
MACFADYEN'S CELL as UNIT of LIFE. 7s. 6d. net.
J. & A. CHURCHILL, 7, Great Marlborough St., W.1.

By W. SOLTAU FENWICK. M.D.

CANCER OF THE STOMACH.

362 pages. 10s. 6d.

ULCER OF THE STOMACH AND DUODENUM.

392 pages. 10s. 6d,

J. & A. CHURCHILL, 7, Great Marlborough St., W.1

DYSPEPSIA

Its Varieties and Treatment.

By Lt.-Col. ROBERT HENRY ELLIOT, M.D., B.S.Lond., F.R.C.S.Eng., I.M.S.(rtd.)

GLAUCOMA:

A HANDBOOK FOR THE GENERAL PRACTITIONER. 4s. net.

GLAUCOMA:

A TEXT-BOOK FOR THE STUDENT OF OPHTHALMOLOGY. 25s. net.

THE INDIAN OPERATION OF COUCHING FOR CATARACT.

7s. 6d. net. H. K. LEWIS & Co. Ltd.

TROPICAL OPHTHALMOLOGY.

With 7 plates and 117 illustrations. 31s. 6d. net.

THE CARE OF EYE CASES:

A HANDBOOK FOR NURSES, PRACTITIONERS AND STUDENTS. 12s. 6d. net.

THE OXFORD MEDICAL PUBLICATIONS.

ESSAYS ON THE

SURGERY OF THE TEMPORAL BONE.

By Sir CHARLES BALLANCE, K.C.M.G., C.B., M.V.O., M.S., F.R.C.S., Consulting Surgeon to St. Thomas's Hospital, &c.

Illustrated by 125 Plates (40 in colour), and 150 Figures.

In 2 volumes. Medium 4to. Price 7 guineas.

MACMILLAN & Co., LTD., St. Martin's Street, London, W.C.

NOW READY.

PULMONARY TUBERCULOSIS.

BY

SIR JAMES KINGSTON FOWLER, K.C.V.O., C.M.G., M.D., F.R.C.P.

With 52 Illustrations. 8vo. 20s. net.

MACMILLAN & Co., Ltd., London, W.C. 2.

SECOND EDITION OF

CECIL WEBB-JOHNSON'S

TWILIGHT SLEEP.

FOREWORD BY

COMYNS BERKELEY, M.C., M.D., F.R.C.P.,

Including all the latest work in England on the subject.

Price 10s. 6d. net.

"The best book on this subject." (*Vide press.*)

BUTTERWORTH & Co., Bell Yard, Temple Bar, London, W.C.2.

CAMBRIDGE ELECTROCARDIOGRAPHS

A COMPLETE outfit comprises an Einthoven String Galvanometer and suitable Illuminating and Photographic Recording Apparatus, together with the necessary switchboards, tables, etc.

Further details are contained in List No. B-180 which will be gladly sent on request.

THE CAMBRIDGE & PAUL INSTRUMENT CO., LTD.

Head Office and Showroooms:

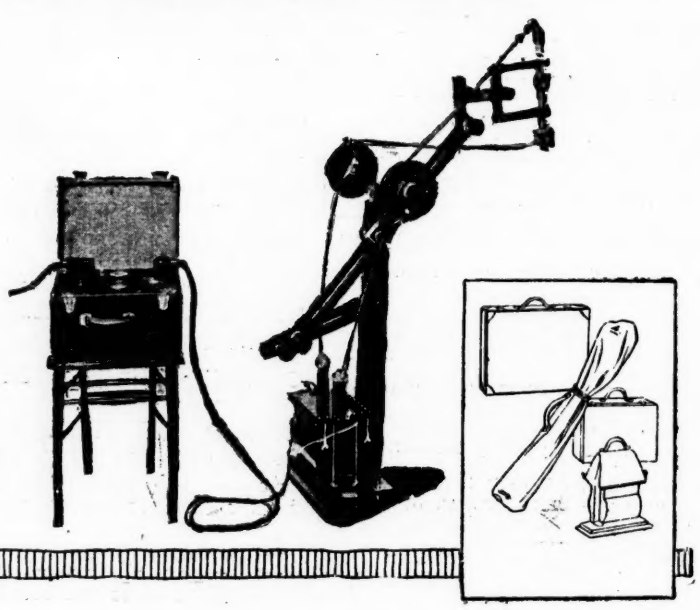
45, Grosvenor Place, London, S.W.1.

Works: LONDON AND CAMBRIDGE.

The Coolidge Portable X-RAY OUTFIT

The Coolidge Portable X-Ray Outfit weighs 125 lbs, consists of 4 packages, can be carried in a car, and assembled ready for use in a few minutes in any private house, doctor's surgery or hospital ward. It is a *complete* outfit and needs only to be set up and connected to any lampholder. No accessories or special wiring are required. Capacity 10 milliamperes at a 5" spark gap.

Price of A.C. Set £265



The British Thomson-Houston Co Ltd
(Owners of the British Patents)
Mazda House, 77 Upper Thames St. London, E.C.4

B T-H

1598

THE RESTORATION OF THE NORMAL CARDIAC MECHANISM IN CASES OF AURICULAR FIBRILLATION BY MEANS OF QUINIDINE SULPHATE.

BY

ALAN N. DRURY AND C. C. ILIESCU,*

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.

FOR many years quinine has been used in conjunction with other drugs for its supposed beneficial action in cardiac cases; but it was not until 1914 that Wenckebach [4] brought forward evidence of a definite action in its power to terminate paroxysms of auricular fibrillation by restoring the normal rhythm. Prompted by this work Frey [2] used various alkaloids of the quinine group separately on cases of chronic fibrillation and found that quinine, and especially the alkaloid quinidine, was effective in restoring normal rhythm. This remarkable work of Frey's has been amplified by many other Continental workers, and by Levy [3] in America, and the number of cases so treated is now well over 100. The return of the normal cardiac mechanism has not been found to be invariable by any workers, the percentages of successful cases varying up to 66 per cent. in the most successful series, the average varying round 50 per cent. of the cases treated. According to past records the duration of the normal rhythm has varied from a few days up to many months.

The cases herein reported, thirteen in number, all army pensioners, have been under continuous observation for varying periods of time. The known duration of the auricular fibrillation is stated from the dates at which they first came under observation, and from which time, the fibrillation is known to have been a constant condition, and has been treated by digitalis or strophanthus therapy.† The supposed duration is based upon the patients' statements of their symptoms.

The method of treatment adopted has been, in the main, that used by previous workers, although certain variations of dosage have been tried, for reasons which will be stated later. The cases, after being cleared of digitalis or strophanthus, have all received one or two preliminary doses of 0.2 gram of quinidine sulphate by the mouth for the purpose of excluding the presence of quinidine intolerance; after which the quinidine sulphate treatment, given in gelatine capsules by the mouth, has been commenced.

The cases have been recorded electrocardiographically both before and during the quinidine treatment. The method of leading direct from the chest was adopted, as it has been shown that this method gives a much more accurate representation of the auricular movement than do limb leads.[1] The records have been taken every two hours—at 10 a.m., 12 noon, 2 p.m., 4 p.m., and 6 p.m. By this method a record of the auricular oscillations and ventricular movement is obtained and the rates of these are counted.‡

Unsuccessful Cases.

CASE I.

A. H., aged 38. No signs of congestion. Heart slightly enlarged. Developed mitral stenosis. Etiology indeterminate. History of frequent attacks of tonsillitis. Probable onset three and a half years ago. Known duration, 5 months.

Quinidine sulphate. Total dosage, 7.8 grams, given as follows:

First day ... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Second day ... 10 a.m., 12 noon, 4 p.m.—0.4 gram.
Third day ... 4 a.m., 8 a.m., 12 noon—0.4 gram; 4 p.m.—0.6 gram.
Fourth day ... 4 a.m., 8 a.m.—0.4 gram; 12 noon, 4 p.m.—0.6 gram.
Fifth day ... 4 a.m., 8 a.m., 12 noon, 4 p.m.—0.4 gram.

The auricular rate per minute fell from 400 progressively till the end of third day, when it reached 235; on fourth and fifth day there was a slight rise, remaining around 275. Ventricular rate per minute rose from 80 to 126 at end of first day, after which it was variable, being generally about 80. Eighteen hours after drug stopped both at original level. Patient complained frequently of short attacks of palpitation.

After seven days, during which the patient received no treatment, quinidine sulphate again given. Total dosage, 2.1 grams, given as follows:

First day ... 9 a.m., 10 a.m., 11 a.m., 12 noon, 1 p.m., 2 p.m., 3 p.m.—0.3 gram.

Auricular rate per minute fell from 425 to 240. Ventricular rate per minute rose from 75 to 118. Sixteen hours after quinidine stopped, both auricular and ventricular rates at original levels. Patient complained of severe headache towards the end of treatment.

CASE II.

T. F. B., aged 28. No signs of congestion. Heart definitely enlarged, but not greatly. Mitral stenosis. Etiology indeterminate. Probable onset of fibrillation five years ago. Known duration eight months.

Quinidine sulphate. Total dosage 11.8 grams, given as follows:

First day ... 10 a.m., 1 p.m., 4 p.m.—0.4 gram.
Second day ... 8 a.m., 12 noon, 4 p.m., 12 midnight—0.4 gm.
Third day ... 8 a.m., 12 noon, 4 p.m., 12 midnight—0.4 gm.
Fourth day ... 4 a.m., 8 a.m., 12 noon, 4 p.m., 8 p.m., 12 midnight—0.4 gram.
Fifth day ... 4 a.m., 8 a.m.—0.4 gram; 12 noon, 4 p.m.—0.6 gram; 8 p.m., 12 midnight—0.4 gram.
Sixth day ... 4 a.m., 0.4 gram.; 8 a.m., 12 noon, 4 p.m.—0.6 gram.

Auricular rate per minute fell from 575 to 350 on the first day, remaining at that level on the second and third with tendency to rise; on the sixth day it had fallen to 325. Ventricular rate per minute rose on the first day from 85 to 120, remained around 90 for three days, and fell on the fifth and sixth to 80; sixteen hours after withdrawal of quinidine both auricular and ventricular rates at original levels.

Patient had no symptoms during treatment. After thirty-six hours with no treatment, quinidine sulphate again given. Total dosage 2.1 grams given as follows:

First day ... 9 a.m., 10 a.m., 11 a.m., 12 noon, 1 p.m., 2 p.m., 3 p.m.—0.3 gram.

Auricular rate per minute fell from 550 to 375. Ventricular rate per minute rose from 75 to 130. Sixteen hours later both at original levels. Patient complained of headache towards end of treatment.

CASE III.

J. M., aged 24. No signs of congestion. Heart considerably enlarged. Developed mitral stenosis. Etiology indeterminate. Probable onset five years ago. Known duration twelve months. Quinidine sulphate. Total dosage 8.2 grams, given as follows:

First day ... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Second day ... 10 a.m., 12 noon, 4 p.m., 10 p.m.—0.4 gram.
Third day ... 8 a.m., 12 noon, 4 p.m., 10 p.m.—0.4 gram.
Fourth day ... 8 a.m., 0.4 gram; 12 noon, 4 p.m.—0.6 gram; 10 p.m., 0.4 gram.
Fifth day ... 8 a.m., 0.6 gram; 10 a.m., 12 noon, 2 p.m.—0.4 gram.

Auricular rate per minute fell from 400 to 260 on the first day. On the second fell from 350 to 265, and progressively on the third, fourth, and fifth, when it was 180. The ventricular rate per minute rose from 70 to 110 on the first day, returning to 72 at beginning of the second day, rising to 115, remaining around 100 for remainder of treatment. Sixteen hours after treatment stopped, both rates at original levels. Patient had no symptoms except occasional short attacks of palpitation. After seven days, during which the patient had no treatment, quinidine sulphate was again given—9.8 grams. First five days' dosage as above; on sixth day, 4 a.m., 8 a.m., 0.4 gram; 11 a.m., 0.8 gram. (Coincident with this the patient was given liq. atropinae, 0.2 per cent. solution, 10 minims per diem.) The auricular rate and ventricular rate were very similar in degree and distribution to first quinidine treatment, but auricular rate did not fall below 200. Twenty-four hours after treatment, both at original levels. Patient complained of dryness of the mouth, but otherwise had no symptoms.

CASE IV.

T. G., aged 46. No signs of congestion. Heart slightly enlarged. Systolic murmur at apex, no diastolic heard. Etiology indeterminate. Probable onset four and a half years ago. Known duration fifteen months. Quinidine sulphate. Total dosage 1.6 grams.

First day ... 8 a.m., 0.4 gram; 10 a.m., 0.2 gram; 12 noon, 0.4 gram; 2 p.m., 0.2 gram; 4 p.m., 0.4 gram.

Auricular rate per minute fell from 425 to 330 at 6 p.m. Ventricular rate per minute rose from 80 to 120 at 6 p.m. At 6.15 p.m. had a syncopal and epileptiform attack, ventricular rate after recovery being very slow and rising gradually. Attack preceded by feeling of sickness and accompanied by diarrhoea. Auricular rate after attack 268, ventricular rate 56. Patient gave a history of similar attacks previously. Twenty-four hours later both rates at original levels.

CASE V.

F. M., aged 22 years. No signs of congestion. Heart definitely but not considerably enlarged. Mitral stenosis. Etiology

* Working on behalf of the Medical Research Council.

† One exception, Case VI, owing to whose usual low ventricular rate treatment was not indicated.

‡ The auricular rates are the average of a series of oscillation counts, and the ventricular rates an average of counts on the same records.

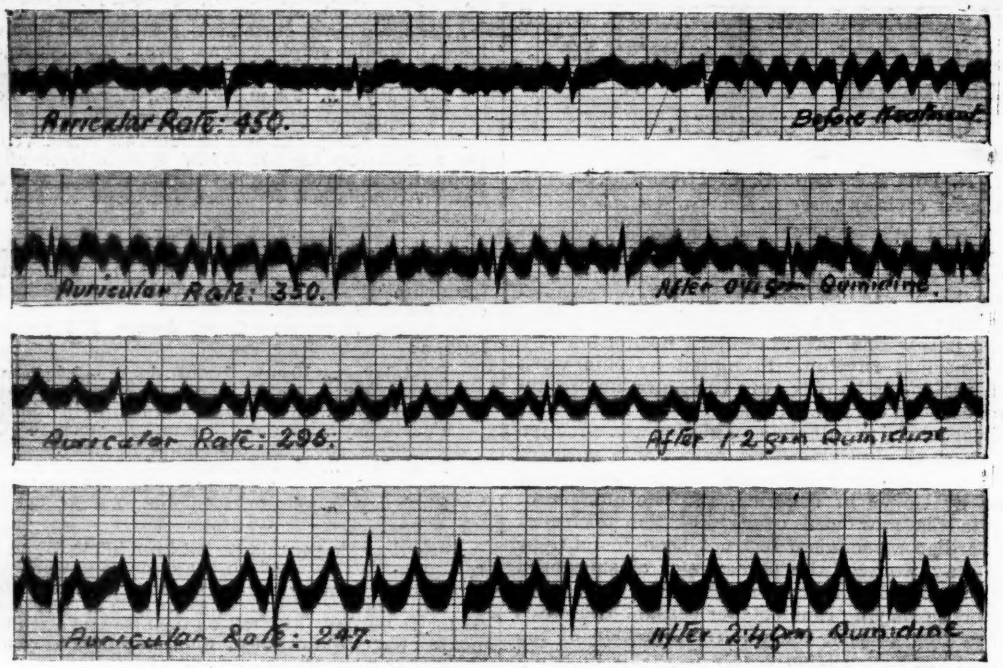


FIG. 1.—Direct chest lead records (sternal lead) from Case XII, showing retardation of auricular rate, with accompanying change in character of the records.

indeterminate. Probable onset indeterminate. Known duration ten months.

Quinidine sulphate. Total dosage 3.6 grams, given as follows:

First day ... 8 a.m., 4 p.m.—0.4 gram.
Second day... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Third day ... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Fourth day... 8 a.m.—0.4 gram.

Auricular rate per minute fell on first day from 475 to 400, rising to 460 at the beginning of the second, and falling progressively to 300 at the end of the third day. At 8.45 on the fourth day pure flutter at 220 appeared, falling at 12 noon to 200, and rising quickly again to 220; during the day it rose to 260, and remained about that rate; pure flutter continuing. Ventricular rate rose very little from 80 the first three days; on the fourth day, when pure flutter appeared, the ventricle responded 2:1 at 110; when auricular rate fell to 200, ventricle responded 1:1, for about one hour at 200, but as the auricular rate rose 2:1 response returned; during the next twenty-four hours patient had several short periods of 1:1 response, when digitalis therapy was commenced, and fibrillation returned after three days of this treatment.

CASE VI.

H. H., aged 39 years. No signs of congestion. Heart, moderate enlargement. Mitral stenosis. Etiology, acute rheumatism. Probable onset three and a half years ago. Known duration seventeen months.

Quinidine sulphate. Total dosage 4.4 grams, given as follows:

First day ... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Second day... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Third day ... 8 a.m., 4 p.m.—0.4 gram; 12 noon—0.2 gram.
Fourth day... 8 a.m., 4 p.m.—0.4 gram; 12 noon—0.2 gram.

Auricular rate per minute fell on first day from 450 to 275, and remained at that level till the third day, when slight rise, followed by a fall to 275, produced on this and succeeding days by interposition of smaller doses at 12 noon. Ventricular rate per minute rose on the first day from 52 to 78, varied between 78 and 60 on succeeding days. Twenty-four hours after drug stopped, both at original rate.

CASE VII.

R. L., aged 40 years. No signs of congestion. Heart slightly enlarged. Valves nil. Etiology indeterminate. Probable onset four and a half years ago. Known duration fifteen months.

Quinidine sulphate. Total dosage 15.2 grams, given as follows:

First day ... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Second day ... 8 a.m., 12 noon, 4 p.m., 10 p.m.—0.4 gram.
Third day ... 8 a.m., 12 noon, 4 p.m., 8 p.m.—0.4 gram.
Fourth day ... 8 a.m., 12 noon, 4 p.m., 8 p.m., 12 midnight—0.4 gram.
Fifth day ... 4 a.m., 8 a.m., 12 noon, 4 p.m., 10 p.m.—0.4 gram.
Sixth day ... 8 a.m., 4 p.m., 10 p.m.—0.4 gram.
Seventh day ... 8 a.m., 4 p.m., 10 p.m.—0.4 gram.
Eighth day ... 4 a.m., 8 a.m., 4 p.m.—0.4 gram,
Ninth day ... 8 a.m.—0.4 gram; 12 noon, 4 p.m.—0.2 gm.
Tenth day ... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Eleventh day... 8 a.m., 12 noon, 4 p.m.—0.4 gram.

Auricular rate per minute fell slowly but progressively, from 450 to 250 on the fourth day, after this the rate remained around 270 till the seventh day, when it rose to 350, and remained at that level till the ninth day when it again progressively fell to 260 on the eleventh day. Ventricular rate per minute rose slowly but progressively from 70 to 110 on the third day, remaining around 90, with several short periods of high rate about 120, till the eleventh day. Twenty-four hours later both at original level. Patient complained of several short attacks of palpitation.

Successful Cases.

CASE VIII.

W. C. S., aged 46. No signs of congestion. Heart slightly enlarged. Valves, no murmurs heard. Etiology indeterminate. Wassermann positive. Liver enlarged and hard. Probable onset four years ago. Known duration nine months.

Quinidine sulphate. Total dosage 2 grams, given as follows:

First day ... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Second day... 8 a.m., 12 noon—0.4 gram; 2 p.m., normal rhythm.

Auricular rate per minute fell from 476 to 340 on first day, remaining at that level till two hours before normal rhythm appeared. Ventricular rates per minute rose from 70 to 100 on the first day, remaining about 80 on the second day till normal rhythm appeared at 67 per minute. The patient complained of no symptoms during treatment.

CASE IX.

F. J., aged 50. No signs of congestion. Heart definitely but not considerably enlarged. Valves nil. Etiology indeterminate. Wassermann negative. Probable onset, five years ago. Known duration seven months. Quinidine sulphate. Total dosage 4 grams, given as follows:

First day ... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Second day... 10 a.m., 12 noon, 4 p.m., 8 p.m.—0.4 gram.
Third day ... 4 a.m., 8 a.m., 12 noon.—0.4 gram; 2 p.m., normal rhythm.

Auricular rate per minute fell progressively from 400 to 300, two hours before normal rhythm appeared. Ventricular rate per minute rose from 120 to 135 on the first day, keeping around 120 till normal rhythm appeared at 69 per minute. The patient complained of no symptoms during treatment.

CASE X.

E. N., aged 31. No signs of congestion. Heart not enlarged. Valves nil. Etiology indeterminate (brothers acute rheumatism). Probable onset four years ago. Known duration thirteen months.

Quinidine sulphate. Total dosage 6.6 grams, given as follows:

First day ... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Second day... 10 a.m., 12 noon, 4 p.m., 8 p.m., 12 midnight—0.4 gram.
Third day ... 4 a.m., 8 a.m., 12 noon, 4 p.m., 8 p.m., 12 midnight—0.4 gram.
Fourth day... 4 a.m., 0.4 gram; 8 a.m., 0.6 gram; 11.30, normal rhythm.

Auricular rate per minute fell from 540 to 450 on the first day, rising to 525 at beginning of the second and falling to 440 and

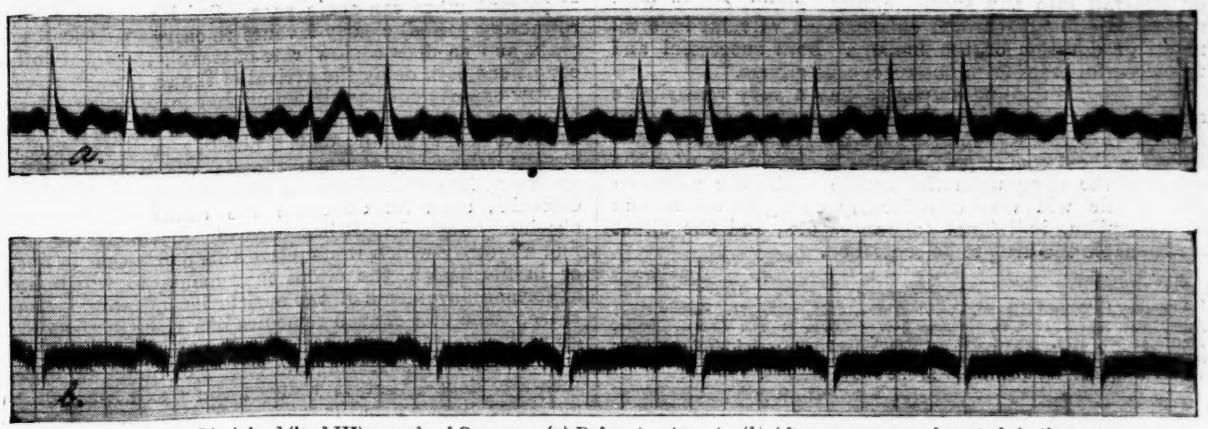


FIG. 2.—Limb lead (lead III) records of Case XII. (*a*) Before treatment. (*b*) After appearance of normal rhythm.

progressively falling to 350 one hour before normal rhythm appeared. Ventricular rate per minute showed slight rise on the first day from 80 to 100, falling to original level at beginning of the second and rising again and maintaining itself around 90 till normal rhythm appeared at 65 per minute. The patient had no symptoms during treatment.

CASE XI.

H. A., aged 27. No signs of congestion. Heart considerably enlarged. Developed mitral stenosis. Etiology, chorea. Probable onset unknown. Known duration fifteen months.

Quinidine sulphate. Total dosage 4.4 grams, given as follows:

First day ... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Second day... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Third day ... 8 a.m., 12 noon, 4 p.m.—0.4 gram; 10 p.m.—0.4 gram.
Fourth day... 8 a.m.—0.4 gram.; 10 a.m., normal rhythm.

Auricular rate per minute fell progressively from 420 to 280 at the end of the second day, showed tendency to rise on the third, and at the end was 350. Sixteen hours later normal rhythm. Ventricular rate per minute rose from 70 to 115 on first day, maintaining itself around 90 till normal rhythm appeared at 70 per minute. Patient had no symptoms during treatment.

CASE XII.

W. W., aged 25. No signs of congestion. Heart considerably enlarged. Developed mitral stenosis. Slight aortic regurgitation. Etiology indeterminate; frequent attacks of tonsillitis. Probable onset two months ago. Known duration four weeks.

Quinidine sulphate. Total dosage 2.8 grams.

First day ... 10 a.m., 1 p.m., 4.30 p.m.—0.4 gram.
Second day... 8 a.m., 12 noon, 4 p.m.—0.4 gram.
Third day ... 8 a.m.—0.4 gram.; 10 a.m., normal rhythm.

Auricular rate per minute fell from 425 to 250 at the end of the second day. Sixteen hours later normal rhythm. Ventricular rate per minute rose from 70 to 105 on the first day, maintaining itself around 90 till normal rhythm appeared at 70 per minute.

CASE XIII.

A. J. P., aged 43. No signs of congestion. Heart moderately enlarged. Valves, mitral stenosis. Etiology indeterminate. Probable onset five years ago. Known duration, twenty months.

Quinidine sulphate. Total dosage 0.8 gram, given as follows:

First day ... 8 a.m., 12 noon—0.4 gram; 4 p.m., normal rhythm.

Auricular rate per minute fell from 450 to 275. Two hours later normal rhythm. Ventricular rate per minute rose from 60 to 85, when normal rhythm appeared at 60 per minute.

The cardiac signs and general symptomatology of the patient before and after successful treatment, and also the duration of the normal rhythm, will be dealt with at a later date.

As can be seen from the foregoing results, the first reaction of the auricular rate is similar in all patients, whether the normal mechanism is finally restored or not; the auricular rate is retarded. Commencing from the figure around the average rate of 450 per minute, the auricular rate falls and has reached a rate of 200 per minute in some of the cases studied; and as the rate falls the character of the records changes. The periods of no oscillation which are found in the direct chest lead records of cases prior to treatment become less frequent, to the point of disappearance, and the oscillations become more regular, both in time and form, and at the low rates the maximum variation between the longest and shortest cycles is about 0.05 second.

The records change from those of fibrillation, passing imperceptibly into those of impure flutter, the impurity of which becomes less and less, but not as a rule attaining the purity of auricular flutter as this is usually seen clinically. A series of such curves taken from Case XII (Fig. 1) illustrates this point. In unsuccessful cases when the drug is withdrawn the impure flutter passing again gradually into fibrillation is shown. Only exceptionally is auricular flutter developed in its pure form (see Case V), and in this case the flutter did not pass again into impure flutter, but continued to flutter after the drug was stopped. The curves of the calculated rates are not smooth during the period of treatment, and there are indications that about two hours after the giving of a dose of the drug the maximum effect is obtained, and thenceforward the auricular rate shows a slight rise. The factor becomes of importance in some cases, as, owing to the lapse of time between the last dose of one day and the first dose of the next, there appears to be opportunity for the auricular effect to vanish, and the condition may be on the second day comparable to that prior to treatment. Through and through, however, the doses suggested by previous workers—that is, 0.4 gram three times a day—are sufficient to ensure a progressive retardation of auricular rate for the first few days, during which time the majority of successfully treated cases have re-established the normal mechanism. The alteration in method of dosage mentioned above has been adopted in some cases in order to maintain a progressive retardation of auricular rate, but such retardation, though continued, does not necessarily ensure the restoration of the normal rhythm in cases which do not respond to treatment in the first few days. It has not been considered advisable to attempt to drive the auricular rate below 200 per minute. There appears to be a definite relation between the auricular rate and the ventricular rate, for as the former falls the latter rises, and vice versa; and although it appears in the later stages of treatment that this relationship is disturbed by the presence of other factors, it has been considered advisable to keep to this limit to avoid the appearance of a 1 : 1 response of the ventricle and its consequent high rate of beating. That the retardation of the auricle is produced by quinidine sulphate is well shown by the fact that upon withdrawing it in cases where the auricular rate has been retarded, the rate mounts, and in twelve to eighteen hours has reached the level prior to treatment. The ventricular rates, similarly ascertained, show certain features in all cases; during the first day the ventricular rate rises, for example, from 70 often up to 120 or more; after this considerable variation is seen, the rate ranging from the last figures to figures which, though lower, are for the most part in excess of that prior to treatment. Upon withdrawing the quinidine sulphate, the ventricular rate falls to its original level.

Thirteen cases of auricular fibrillation have been treated with quinidine sulphate, and in six cases the normal rhythm has been re-established, while in the remaining seven cases, although similar changes have been produced in the retardation of the auricular rate the movement persisted without break, and the rate returned, upon withdrawal of the drug, to its original level.

The percentage success obtained is of the same order as that obtained by several other workers, and the successful and unsuccessful cases, as previous workers have shown,

do not fall into any special clinical group, either with regard to otiology, cardiac enlargement, valvular involvement, or duration of the malady. Both successful and unsuccessful cases form heterogeneous groups.

The drug, quinidine sulphate, has a very remarkable action upon the auricle, and this action is of a potent nature. For this reason alone the method of direct leads from the chest is of importance, for it gives a record of the effect of the drug upon the auricle itself; the effect on the auricle will vary considerably owing to the factors of absorption, individual tolerance, etc., and the direct leads enable the drug to be controlled.

REFERENCES.
[1] Drury, A. N. and Iliescu, C. C.: *Heart*, 1921, viii, 171. [2] Frey, W.: *Berl. klin. Woch.*, 1918, lv, 417 and 849. [3] Levy, R. L.: *Journ. Amer. Med. Assoc.*, 1921, lxxvi, 289. [4] Wenckebach, K. F.: *Die unregelmässige Herztätigkeit und ihre klinische Bedeutung*, 1914, 125 and 128.
Full references will be found in the above articles.

THE MANNER IN WHICH QUINIDINE SULPHATE ACTS IN AURICULAR FIBRILLATION.*

BY
THOMAS LEWIS, A. N. DRURY, C. C. ILIESCU, AND A. M. WEDD,
UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.

THE action of quinidine sulphate upon the fibrillating auricle, an action but recently discovered, is perhaps one of the most remarkable and dramatic which is now known to therapeutics. The essential feature of the reaction is an invariable and conspicuous reduction of the rate at which the auricle beats; in patients in whom treatment is successful this progressive slowing of the auricular action is abruptly disturbed, the disordered action ceases, and the normal action is at once resumed.

To understand how these changes are brought about is of obvious importance; but this problem cannot be solved unless we are able first to understand the mechanism of fibrillation itself. Several views of the reaction of the fibrillating auricle to quinidine have been published, but as these all assume that fibrillation of the auricle is caused by rapid impulses, arising at one or more irritable centres in the muscle of the auricle, and to which the auricle responds in a confused manner, the explanations founded upon such an assumption remain inadequate. These theories of auricular fibrillation, until recently widely held, have undergone extensive revision, and are now scarcely acceptable.

Recently a series of papers[2] has been published from this laboratory, in which it has been shown that in auricular fibrillation a circus movement exists in the auricle; that a single wave is propagated and revolves perpetually upon a re-entrant path. The circus movement is repeated in the average 450 times a minute, and it is this circulating wave which, in its revolution, alone controls the beating of the auricle. The auricle is no longer controlled by discrete impulses arising at a single point on the auricular muscle, each impulse originating a corresponding discrete wave of contraction in the auricle which dies away and is renewed, but by a never-ending wave which passes over and over again through the same muscular channels. To understand the action of quinidine it is necessary to understand the factors which control this circus movement. They have been stated previously, and are: (*a*) the length of the path followed; (*b*) the duration of the refractory period at any given point; and (*c*) the speed at which the wave is conducted.

Circus movement in the auricle is only possible (1) if a circular path of sufficient length is available; (2) if the refractory period is sufficiently short; and (3) if the speed at which the wave moves through the muscle is sufficiently slow. Otherwise the crest of the advancing wave in re-entering muscle through which it has already passed will discover this muscle to be still refractory and will be unable to proceed. The wave in travelling leaves muscle behind it which is for some time incapable of response; time must elapse to permit recovery before the new or re-entrant wave can again pass. Quick recovery (a short refractory period) clearly favours re-entry; so does a long path, and so does a slow rate of travel, for the two last conditions both delay the arrival of the re-entrant wave.

Now experiment has shown us that in auricular fibrillation the gap between the crest of the advancing wave and its wake is very small; on the circular path, the wave is always advancing through muscle which has but just recovered its excitability; the presence of some gap is all-essential, upon its existence the continued movement absolutely depends. It has been stated that if we could find a remedy which would close this gap, either in flutter or in fibrillation, the circus movements to which these abnormal movements of the auricle depend, would at once cease. The first of such remedies has been discovered in quinidine.

Hoffmann[1] in observing the effects of quinidine experimentally found that it reduces the excitability of the auricular muscle; that is true, but it was not made clear by his experiments how this reduction happens, neither is a reduced excitability in itself a sufficient explanation of the remarkable effects of quinidine on the fibrillating auricle. In recent experiments, a full report of which will be published elsewhere, we have found that the most striking action of quinidine upon the auricle is a lengthening of the refractory period; the lengthening which occurs, when doses comparable to those used clinically are employed, amounts to 50 per cent. or more. The reason why quinidine brings fibrillation of the auricle to an end seems to us therefore not to be in doubt. It prolongs the refractory period of the auricle and delays the recovery of the tissue, thus rendering the gap between the crest and the wake of the circulating wave shorter and eventually abolishing it altogether; when the last event happens the abnormal action of the auricle ceases and the normal impulses are thus enabled once again to resume control.

Though we do not doubt that this is the explanation of the successful treatment, the problem is not quite so simple as it may at first seem; for quinidine has not only this action upon the refractory period, it has further actions. The most important of them from our present standpoint is an effect on the rate of conduction; it slows conduction in the auricle. Now slowing of conduction favours re-entry; it prolongs the gap. Thus quinidine exerts two effects which, so far as circus movement is concerned, are opposed to each other; on the one hand, by prolonging the refractory period it tends to shorten the gap; on the other hand, by slowing conduction it tends to lengthen the gap. It is only in those cases where the first effect predominates over the second that the gap will close and the circus movement will terminate. In patients suffering from chronic auricular fibrillation the first effect appears to predominate in approximately 50 per cent. of the cases, for in this percentage auricular fibrillation is abolished; in those patients (the remaining 50 per cent.) in whom this desired end-result is not obtained, it would seem as if the second effect predominates, or that the opposed effects are exerted equally. It is to be noted that in patients in whom fibrillation is not abolished there is nevertheless slowing and usually very profound slowing of the auricle, the rate falling from its original rate of 400, 500, or 600 per minute to 300, 250, or even 200 per minute; such slowing would be the anticipated effect of depressed conduction in the auricle, and it is probable that it is to be ascribed to this cause, in the main, at all events.*

The theory of fibrillation which we support—namely, its dependence upon circus movement—is one which, in the light of our recent experiments upon quinidine, is fully competent to explain the remarkable action of this drug upon the disorderly action of the auricle under consideration. We publish this note at the present time to draw attention to our view of the manner in which quinidine acts, believing that treatment by means of quinidine, which is now engaging the attention of many workers, is best controlled when its action is interpreted in the way which we suggest, and that further progress in this method of treatment, already highly successful, promises to come

* Being a preliminary account of work undertaken for the Medical Research Council.

* Another factor—namely, lengthening of the path, the wave seeking a new and longer path of re-entry as it finds the old one closed—possibly contributes; but we do not at present regard it as the main factor. It is also to be noted that quinidine very probably affects what we have termed the partial refractory period, and some evidence in this direction has been obtained. But these factors, at present regarded as minor ones, are as yet unripe for discussion.

from a consideration of those factors which we here discuss. At the same time it may be wise to utter a word of warning against the indiscriminate and uncontrolled use of this powerful remedy. It is a remedy of which we still have much too little knowledge; it is one which, unless it is strictly controlled by frequent records of the auricular and ventricular action, is not without serious risk. The time will no doubt come when its use in general practice may be advocated; but it has not yet come.

A phenomenon which not uncommonly disturbs treatment is a rise of ventricular rate; this rise of ventricular rate is almost invariable as the heart comes under the influence of quinidine. Experimental work goes to show that this rise may be due to two causes, acting probably together. A fall of auricular rate is itself sufficient to produce a lesser grade of block and a resulting rise of ventricular rate. But we find that quinidine has a paralysing action on the vagi, an action not altogether unlike, though less powerful than that of atropine; by reducing vagal tone the drug will increase the power of the junctional tissues to conduct, and lift the ventricular rate, as does atropine. Opposed to these actions is a direct action of the drug upon the junctional tissues; this has been shown by several workers,[3 4] and we can fully confirm it. This opposed action probably moderates in some measure the rise of ventricular rate which occurs during the clinical use of quinidine in cases of auricular fibrillation.

REFERENCES.

[1] Hoffmann, F. B.: *Zeit. f. Biol.*, 1920, lxxi, 47. [2] Lewis, T., and others: *Heart*, 1920, vii; 1921, viii. [3] Hecht and Rothberger: *Zeit. f. d. ges. exper. Med.*, 1918, vii, 135. [4] Schott: *Deutsch. Archiv f. klin. Med.*, 1920, cxxxiv, 203.

ENLARGEMENT OF A SPLENCULUS TO THE SIZE OF A NORMAL SPLEEN

AFTER REMOVAL OF A RUPTURED SPLEEN TEN YEARS PREVIOUSLY.

BY

W. McADAM ECCLES, M.S., F.R.C.S.,

AND

G. D. FREER, M.B., D.P.H.

On May 24th, 1910, Mr. R., aged 21, while playing football in Kuala Lumpur, Federated Malay States, collided with another player, and in doing so received a violent blow over the splenic region. He felt somewhat faint, but continued playing for about twenty minutes. He then began to feel much worse, complaining of pain in the abdomen, particularly in the left upper area. Faintness increased and he vomited once. The accident occurred about 6 p.m., and he was admitted to the European Hospital at 8 p.m. On admission, he was very pale but without an anxious expression; pupils widely dilated; pulse very weak and thready, 95 per minute. On examination of the abdomen there was dullness over the splenic region and for about a handbreadth below the left costal margin and in the left loin. Tenderness was observed over the epigastric and splenic regions. Liver dullness present. At 10 p.m. the patient was somewhat restless. The dullness over the spleen and liver had given way to a tympanitic note. The pulse was still feeble, and had increased to 100 per minute. He was then operated on by Dr. G. D. Freer, with the assistance of Dr. John Gray.

The abdomen was opened in the middle line over the epigastrium. The peritoneal cavity was found to contain blood, and on the spleen being examined it was seen that it was torn on the inner side in the region of the hilum. The incision was enlarged, and a transverse cut made towards the left, dividing the left rectus muscle. The whole spleen was then removed after the pedicle had been secured with a double ligature, a number of forceps having been applied for safety before the pedicle was severed.

That the actual spleen was removed is proved by the following evidence. It was weighed by Dr. J. P. Masters and found to be 13 oz., a normal spleen weighing in the adult about 7 oz. The patient had apparently contracted malaria previously to the accident, and the enlargement of his spleen may have contributed to the ease with which it was ruptured. Dr. John Gray, who helped at the operation, says in a letter to one of us (W. McA. E.), "the spleen was completely removed." Miss A. McBride, who was sister in the theatre at the time of the operation, writes: "I saw the operation . . . the spleen was removed," and Miss H. M. Shaw, a nurse who was assisting in the theatre, writes: "I was busy during the operation with keeping a supply of hot water and saline ready, so I cannot say that I actually saw the spleen removed, but I heard the remarks made when it was out, and I went to the laboratory the next day and saw it."

The patient made a somewhat complicated recovery, having what was thought to be mild malaria, and some trouble at the base of the left lung. He was discharged from hospital on July 5th, 1910. On that date an examination of the blood showed—red cells, 4,800,000; haemoglobin, 75 per cent.; leucocytes 9,000, with polymorphonuclears 51 per cent., lymphocytes 8 per cent., large mononuclear 31 per cent., and eosinophiles 10 per cent. It was stated by Dr. A. T. Stanton, of the Institute for Medical Research, Kuala Lumpur, who made the examination, that the somewhat low colour index, slight leucocytosis, with relative increase of large mononuclear forms (? a souvenir of malaria) and of eosinophiles, are the only features worthy of remark.

A further blood examination was made by Dr. Stanton on August 10th, 1910, five weeks later, and the red cells numbered 5,600,000; haemoglobin, 90 per cent.; leucocytes 7,000, with polymorphonuclears 44 per cent., lymphocytes 26 per cent., large mononuclear 15 per cent., and eosinophiles 15 per cent.

On full recovery the patient was able to carry out his duties in the Malay States without any untoward symptoms, and states that he was assured that he would not suffer again from malaria as he was minus his spleen! He continued in good health for eight years, after which he began to have some attacks of weariness, and was found to have an evening temperature. It was considered by his medical advisers that this might be due to some obscure form of tubercle.

Early in 1920 his general condition was in no way improved, and he was losing weight. With this the ventral hernia, which had been gradually developing at the site where the left rectus had been cut through, became much increased in size, and caused considerable inconvenience. It was decided that he should come to England for advice. He came via the Cape of Good Hope, and on arrival, after a journey of four months, was considerably improved, having lost his temperature and gained flesh.

He was sent to one of us (W. McA. E.) by Dr. Marcus Johnson with a view to the cure of his traumatic hernia. On examination it was found that in general health he appeared well, was not anaemic, and had no temperature. There was a wide gap in the upper third of the left rectus, and on coughing a marked protuberance of abdominal contents took place. It was decided to attempt a cure by operation.

On September 4th, 1920, ether was administered by Dr. C. F. Hadfield, Mr. W. Girling Ball acting as Mr. Eccles's assistant, the matron of the nursing home and the theatre sister also being present. On opening the abdomen some adhesions of omentum were found and separated. Then, to the astonishment of all present—and each one of five persons confirms the fact—a well-formed, normal-looking spleen was seen in the usual position.

Knowing the previous history, the organ now found was fully examined. It was taken in the hand of Mr. Eccles, drawn forward, found to have a definite pedicle in which could be felt pulsating vessels. The shape, size, notch, colour, and consistency all appeared to be that of a normal spleen. Each person present was requested to look well at the organ, and all agreed that it appeared to them to be a normal spleen. The left kidney region was then examined and a normal left kidney palpated. A radical reparative operation was performed upon the gap in the left rectus and the abdomen closed. The patient made an uninterrupted recovery, the hernia remaining cured up to the time of this record.

That a splenculus may enlarge, after the removal of an ordinary spleen, is well known, but the rarity with which such an enlarged organ is actually seen during life makes it desirable to place this case on record.

THE next French Congress of Psychiatry will commemorate the tercentenary of François Bayle, born in 1622.

EIGHTY-NINTH ANNUAL MEETING

OF THE

British Medical Association.

Held at Newcastle-on-Tyne, July, 1921.

SECTION OF OBSTETRICS AND GYNAECOLOGY.

Professor R. P. RANKEN LYLE, M.D., President.

DISCUSSION ON CAESAREAN SECTION.

OPENING PAPERS.

INDICATIONS FOR CAESAREAN SECTION.

BY

J. M. MUNRO KERR, M.D.,

Professor of Obstetrics and Gynaecology, Glasgow University; Gynaecological Surgeon, Royal Infirmary; Honorary Fellow, American Gynecological Society.

WITH the exception of the toxaemias of pregnancy there is at the present moment no problem in obstetrics more interesting than Caesarean section.

In order to secure as much advantage as possible from this discussion, Dr. Eardley Holland and I asked the leading hospitals in the country to give us their returns for Caesarean section during the last ten years. We desire to thank all those who have been good enough to collect the figures, which we hope to publish in detail at a later date. As the returns were only received a week or ten days ago in many instances, it has not been possible to make full use of them on the present occasion; we are able, however, to present some very interesting figures.

Dr. Eardley Holland and I have decided that in to-day's discussion he will consider particularly the technique of the operation, and I will refer more especially to the indications.

The modern operation of Caesarean section dates back to the eighties of last century. Then it was that Sänger introduced stitching of the uterine wound which brought the operation within the scope of practical obstetrics; previously the uterus had been left unstitched, and only very occasional successes were recorded. In this country the name of Murdoch Cameron deserves special mention, for shortly after Sänger's early successes he also recorded a number of cases with equally satisfactory results. It is but fitting, therefore, that in discussing Caesarean section to-day we should recognize their great services to ostetrics.

At the time when Sänger and Murdoch Cameron began their work on Caesarean section practically the only accepted indication for the operation was contracted pelvis; moreover, the degree of pelvic deformity was placed much lower than it is to-day. With ever-improving results the lower limit has gradually been raised, until at the present moment the border line between vaginal delivery and Caesarean section may be placed at 3¼ in. (8.1 cm.). Another complication which was accepted early as an indication for the operation was the presence of tumours of the uterus or ovary obstructing the parturient canal, for gradually, as hysterectomy and ovariotomy became perfected, the obstetric surgeon came to appreciate the possibility of employing Caesarean section when such tumours caused dystocia.

These two conditions, where a distinct obstruction was present, were fairly obvious indications. Very different was the suggestion made by Lawson Tait, as far back as 1898, that placenta praevia should be dealt with by Caesarean section. It is no exaggeration to say that his paper came as a veritable bombshell, for it must be remembered that obstetrics was, at that time, more a branch of medicine than of surgery, and was controlled largely by the physicians.

Early in this century another indication was advanced—namely, severe eclampsia during the later weeks of pregnancy; in recent years the operation has been further extended to some of the other manifestations of toxaemia of pregnancy.

Other indications have been suggested from time to time, such as accidental haemorrhage, impacted transverse presentations, alterations in the axis of the canal from ventrofixation, extreme rigidity of the canal, and narrowness of the vagina. Indeed, there is hardly one of the graver complications of parturition which has not been mentioned as a suitable indication, under special circumstances, for Caesarean section.

The scope of any surgical procedure or operation will always extend as the technique is improved and the mortality and morbidity reduced, and it is for us obstetric surgeons so to perfect the technique of Caesarean section that we can extend its scope. Therefore I take it that the remarks of Dr. Eardley Holland on technique are more important than mine on indications.

Before discussing the various indications for this operation, I feel it necessary to utter a word of caution regarding the danger of extending it unduly and rashly. In certain conditions, such as pelvic deformity and fibromyomata obstructing the parturient canal, there is no doubt that Caesarean section is indicated; in the others, however, it is not absolutely indicated, and in dealing with them discretion must be exercised, and the cases selected with discrimination. This is the great fascination of obstetric practice—the selection of the most suitable treatment. It calls for resource and judgement.

The weakness in Caesarean section at the present time is that it leaves behind a uterus permanently injured and liable to rupture should another pregnancy occur. Dr. Eardley Holland will give details regarding this danger and how it is to be avoided. Until we can secure an absolutely sound uterine cicatrix the operation of Caesarean section cannot be extended as far as many of us desire. Take, for example, the position of Caesarean section as regards grave toxaemia, such as eclampsia. In many cases the patient is a young primigravida. At the present moment we must either sterilize this young patient—a most unfortunate procedure, for she may lose her child—or leave her unsterilized and subject to the risk of rupture at a subsequent pregnancy or parturition. Could we say that the uterine wound after Caesarean section is so sound that the possibility of rupture may practically be excluded, then we could confidently employ the operation in many cases which to-day are dealt with by the older accepted methods. But we cannot do this. It is no use shutting our eyes to the fact that Caesarean section, performed in the manner generally favoured, leaves the uterine wall very decidedly weakened. Personally, I believe there is a solution, but this subject is outside my brief in to-day's discussion.

When Dr. Eardley Holland and I introduced the subject of Caesarean section at a discussion in London in May, 1920, I said:

"I feel I am voicing the opinion of all enlightened obstetricians, in this and other countries, when I say that our desire is to perform the conservative operation and not sterilize the patient. We feel that sterilization of the patient after Caesarean section, unless there is some definite disease of uterus, heart, lungs, etc., or mental weakness, is a crude procedure and only justifiable if it is proved beyond doubt that it is not possible to secure a sound uterine cicatrix. If such a decision is forced upon us it will be most unfortunate, for it will undoubtedly compel us to limit the scope of Caesarean section, and preclude us from extending the operation to many obstetrical complications which we feel could be more suitably dealt with by Caesarean section than by the ordinary methods at present employed."

My duty to-day is to discuss indications, but before entering into details I would ask those who have been engaged in obstetric practice for many years to call to mind the cases in which they have experienced great difficulty in delivering the child. I am certain that, in common with myself, they can recollect cases in which the results to mother and child would have been infinitely better if, instead of delivering the child with difficulty by the vagina, they had boldly selected the operation of Caesarean section. Many here, for example, can recall, as I can, elderly primigravidae, sometimes even young primigravidae, with relatively rigid and narrow vaginae, in whom the cervix dilated slowly and the presentation was often an occipito-posterior, and where, finally, delivery was effected with great difficulty and considerable injury to both mother and child, possibly even with death of mother or child, or both. We can recall also cases of very large children and slightly underdeveloped pelves, of placenta

praevia in primigravidae, and many other grave complications.

It is all a question of the relative danger between the purely surgical procedure of Caesarean section and the older method of force, either at the end of the forceps, or trunk and after-coming head, if the child is delivered breech first.

One often hears the argument advanced that, as obstetric practice is largely carried out in private houses, the scope of Caesarean section cannot be extended. The longer I practise obstetrics the more convinced do I become that all deliveries should be carried out in hospitals or nursing homes. At the present moment maternal mortality and morbidity is practically the same as it was thirty or forty years ago. How can it be otherwise? In no private house can any obstetrical operation be carried out as satisfactorily as in a hospital or nursing home where there are plenty of assistants and all the surgical appliances necessary for the carrying out of any surgical procedure. Victor Bonney gave recently a graphic and amusing description of ordinary domestic obstetric practice, and pointed out the futility of hoping that satisfactory progress could be made in lessening maternal mortality as long as conditions remain as they are. Some may say that it is impossible to furnish hospital accommodation for such a large number of patients. Personally, I am convinced that the time will come when very few women indeed, and practically no primigravidae, will be treated in their own homes. The sooner this comes the better.

Some assert that the younger school of obstetricians are too surgically inclined in their methods, but it is impossible to make the practice of obstetrics too surgical. In the management of a normal labour the first essential is surgical cleanliness. There is, of course, the danger that surgical procedures for the delivery of the foetus may be unwisely chosen and sometimes unnecessarily employed. I have already referred to this. But what would be the position of obstetric practice to-day if the advice of the over-cautious physician-obstetrician had been followed in the past?

Indications.

Contracted Pelvis.

Speaking generally, unless the child is very small Caesarean section should be chosen if the conjugata vera is 3¼ in. (8.1 cm.) or under. I do not imply that it is never necessary at 3½ in. (8.7 cm.), for even above that figure it may occasionally be indicated; nor do I mean that some other operation should not occasionally be substituted for it even at 3 in. (7.5 cm.). All I wish to imply is that when the conjugata vera is 3½ to 3¼ in. one must estimate very carefully the relative size of the head and the pelvis. Any other procedure than Caesarean section should only be employed if the overlapping is slight and a certain degree of fixation of the head in the brim of the pelvis can be secured by pushing the head into the pelvic brim.

The method I employ for estimating the size of the head and the pelvis was described by me several years ago. By using the thumb I find I can estimate with accuracy the relative size of the head and the pelvis, and can predict whether the child can be brought safely through the pelvis or not.

At different times, and more especially ten or fifteen years ago, the relative merits of Caesarean section and pubiotomy were frequently discussed. As far as I can judge the consensus of opinion is now in agreement with my personal experience that pubiotomy is relatively seldom a suitable treatment for contractions at the pelvic brim, because the gain in the conjugate is so slight for each inch of separation at the pubis. I shall point out in a moment, however, that it is particularly suitable for certain varieties of contraction at the outlet. The cases of contraction at the brim suitable for pubiotomy are those in which the accoucheur has carefully estimated the relative size of the head and the pelvis, has erroneously come to the conclusion that spontaneous delivery will occur, has made one or two attempts with forceps (employing moderate traction), and has failed to deliver. If pubiotomy is employed in such circumstances it gives excellent results.

For contractions at the outlet, however, as already mentioned, pubiotomy is specially suitable, because every inch of separation of the pubic bones gives a corresponding increase between the tuberosities of the ischia. Pronounced degrees of kyphotic or masculine pelvis, where the head is arrested at the outlet, are the most striking examples.

Induction of labour does not come into competition with Caesarean section, for very rarely are the results from induction satisfactory if the conjugata vera is under 3¼ in. Induction of labour is indicated in the particular case where at a previous parturition the accoucheur has experienced difficulty in extracting the child with forceps and feels that a slightly smaller child could be easily delivered; he therefore chooses induction of labour on the next occasion.

It may be taken as a general rule that Caesarean section should always be performed if the child is alive, and craniotomy if the child is dead; but there are exceptions to both these rules. For example, in extreme degrees of pelvic deformity it may be impossible to deliver by craniotomy, even although the child is dead, while in certain cases when the child is living and when numerous examinations have been made, it is not so certain that Caesarean section should be selected.

Obstetricians have not come to a definite finding as to the employment of Caesarean section in so-called septic and suspect cases. Dr. Eardley Holland will have something to say on this matter, but it is necessary that I too should make reference to it. Some years ago, in nine consecutive infected cases (not simply "suspects"), I took cultures from the cervix prior to the operation. In all I found numerous pyogenic organisms in mixed and in pure culture, and in seven of the cases found streptococci. I had one death from septicaemia in these cases, a mortality of 11 per cent., which is a fairly satisfactory result. I believe this result could be improved by a still more thorough disinfection of the vagina and cervix prior to operation. I, however, employed a procedure which I believe Edge and I thought of simultaneously. The placenta was not removed through the uterine wound, but left to become detached and expelled through the vagina. So far as I can judge, at the present time this procedure and very thorough disinfection of vagina and cervix are the only means by which one can lessen the risks of infection in cases of this nature. If the placenta and membranes are dragged up through the uterine wound, which is the ordinary procedure, the raw uterine surface is streaked over with the ragged ends of the membranes, and infection of the uterine cavity is almost certain to occur.

The statistics for this indication will be given later by Dr. Eardley Holland.

Tumours.

The tumours which most commonly obstruct parturition are fibromyomata and ovarian cystomata. Occasionally rarer forms, such as lymphadenomata, enchondromata, and osteomata, may be encountered.

Fibromyomata.—It is unnecessary to discuss this condition in any detail, for it is generally agreed that if a fibroid tumour obstructs the passage of the child from the uterus the only procedure is Caesarean section. On no account should the child be dragged past the tumour. The only point requiring mention is the fact that in a number of cases in which obstruction seems likely to occur the tumour is dragged up in the early stages of labour. I have observed this on several occasions. In connexion with this indication our tables give summaries of eighty-eight cases, with a maternal mortality of 8 per cent. and a foetal mortality of 19 per cent. The high foetal mortality is interesting, and is accounted for by the fact that in a considerable number of cases the children were premature, and in many the tumours interfered with the growth and development of the foetus. Glancing over the records, I am inclined to think that a few of the cases might have been dealt with by myomectomy and vaginal extraction of the child.

Ovarian Cystomata.—Caesarean section is rarely necessary in ovarian tumours complicating labour. The treatment should be to remove the tumour and allow the child to be delivered by the natural passage. The ovarian tumour can generally be raised out of the pelvis and removed if the patient is placed in the Trendelenburg position and an assistant pushes it up from the vagina, should it be impacted in the pelvis. In very exceptional

cases, in which the tumour cannot be removed, then obviously the course is Caesarean section. We are a little surprised, therefore, at the large number of Caesarean sections performed for ovarian tumours, for in our tables there are thirty-nine cases of Caesarean operation for this complication, with a maternal mortality of 10 per cent. and a foetal mortality of 8.6 per cent.

Other Tumours.—In addition to these commoner tumours, there are 2 cases of broad ligament cysts, 4 of malignant ovarian tumours, 1 of tumour of the bladder, 10 tumours of the pelvis, 9 tumours of the pelvic colon and rectum, and, lastly, 25 cases of carcinoma of the cervix. It is impossible to go into details regarding these tumours, but, taking them altogether, there is a maternal mortality of 17.6 per cent., and a foetal mortality of 33 per cent. The deaths in this group practically all occurred with carcinoma and malignant ovarian tumours.

Eclampsia.

Taking our tables, we have 236 cases in which Caesarean section was performed for eclampsia, with 71 maternal deaths, which gives a maternal mortality of 30 per cent. There is no doubt that the mortality would be lower if the operation were performed earlier. Our great difficulty here is in selecting the cases suitable for this very radical procedure, for everyone who has been engaged in obstetric practice for any length of time must have encountered many most unpromising cases which recovered by ordinary medical and obstetrical procedures. Personally, I think that we should not encourage the very extensive employment of the operation for this condition, although I am quite convinced Caesarean section is advisable in a few instances, but rather concentrate on preventive treatment, for, in common with many other obstetricians, I have rarely seen a case of severe eclampsia in a woman who has been carefully attended and treated during her pregnancy. Again, this disease affects more especially primigravidae—for example, our figures show 79 per cent. of primigravidae. There is, further, this important point, that in a considerable number of cases the child is seriously affected. It is not as good a life as the child in contracted pelvis or placenta praevia. This is well borne out by our figures, which show a foetal mortality of 44 per cent. Unfortunately, from the records it is impossible to state how many children were premature, but undoubtedly this is an important factor, and accounts for the high death rate, although many undoubtedly succumbed to the same poison that so seriously affected the mother. The cases suitable for Caesarean section are those in which the pregnancy is well advanced but in which there is no dilatation of cervix or attempt at labour, and where, after six hours, there is no improvement from blood-letting, intravenous saline infusion, and morphine. Where the seizures occur earlier in pregnancy than the thirty-second or thirty-third week vaginal Caesarean section is preferable.

Placenta Praevia.

The gradual acceptance of Caesarean section as a method of treatment for certain cases of placenta praevia is particularly interesting to those of us who have been engaged in obstetric practice for a considerable number of years. As already mentioned, the operation was recommended by Lawson Tait in 1898, and I can remember perfectly well how obstetricians ridiculed his suggestion.

The great argument in favour of Caesarean section in placenta praevia is that, theoretically, the maternal mortality in uncomplicated cases should not be higher than 3 to 4 per cent., and the foetal mortality 2 to 4 per cent. Our tables show in 131 collected cases 13 maternal deaths, a mortality of 10 per cent., and a foetal mortality of 15 per cent. Placenta praevia treated by the ordinary methods of plugging, version, rupture of the membranes, etc., gives a maternal mortality of about 4 to 10 per cent., and a foetal mortality of about 40 to 50 per cent. It appears to me, therefore, that this particular complication is peculiarly suitable for Caesarean section, and it may come to be the general method of treatment in all cases of the central or marginal varieties. I think we can put aside the lateral variety, for by rupture of the membranes and a slight separation of the lower pole of the placenta both the maternal and foetal mortality should be very low indeed. At the present time I am quite convinced that Caesarean section should always be selected in the case of a primigravida with a central placenta praevia, for the plugging, manual manipulations, version, delivery of the shoulders and head, are associated with much greater danger to the mother and infinitely greater danger to the child than the more surgical procedure of Caesarean section. Personally I have employed it on six occasions, and all the mothers and children were saved.

We have not been able to analyse the figures very completely, but we are convinced that many of the maternal and foetal fatalities could have been prevented if the operation had been performed earlier. In this particular condition it is of vital importance to operate early if we are to admit Caesarean section as an accepted treatment.

Accidental Haemorrhage.

Naturally, in discussing Caesarean section for accidental haemorrhage, I only refer to the graver examples of this complication. The first point to keep clearly in mind is that accidental haemorrhage is on a different footing to placenta praevia. In accidental haemorrhage the child need not be considered; it can practically never be saved. Consequently, we cannot advocate the employment of Caesarean section for this complication in the interests of the child. It seems to me that we should try to find a more conservative method of treatment by which we can secure as good, or nearly as good, results. At a recent meeting in London, when the subject of ante-partum haemorrhage was discussed, some very interesting remarks were made by different speakers, and more particularly by Gordon Ley, who pointed out the good results which he had recently secured, and which I understand continue, from keeping the patient quiet, wrapping her in hot blankets, giving her morphine, if necessary, to quieten down the circulation, and administering 1 c.cm. of pituitary extract as soon as labour pains started. There must, however, remain—and Ley admits this—a certain number of cases which do not respond to this treatment, and Caesarean section is the only course open; but it is satisfactory to think that possibly the examples of this complication requiring Caesarean section are relatively few. Into the question of the conservative operation or hysterectomy for accidental haemorrhage, where abdominal section is necessary, I cannot enter, for that raises the whole subject of the treatment of accidental haemorrhage. The point I want to emphasize is that it is necessary in relatively few cases, and differs from placenta praevia, in which Caesarean section seems to be indicated in a fair number of cases. Our tables show 20 per cent. mortality for the concealed variety.

Ventrofixed Uterus.

Most obstetric surgeons have encountered cases of this nature in which it is necessary to perform Caesarean section. Our tables show fourteen cases with no maternal but two foetal deaths. The matter calls for no discussion. The practical point is that it is inadvisable to perform ventrofixation in relatively young women. I have on one occasion after opening the abdomen separated the uterus from its adhesions and allowed the parturition to continue by the natural passage. By this procedure it may be possible in some cases to avoid the necessity of Caesarean section.

Interposition Operation.

This most valuable operation for cystocele should not be performed until after the menopause, as it invariably results in extreme dystocia. In our figures there are three cases in which Caesarean section was necessary. All the mothers recovered, and all children were born alive.

Prolapse of the Cord.

We venture to think that few obstetricians of experience would advocate Caesarean section for this condition. Although the foetal mortality from this complication is considerable there are means of replacing the cord, even when the cervix is comparatively little dilated. Still, I would have no hesitation in performing the operation, although I have never done so, if the patient were an elderly primigravida and the cervix were rigid. The best repositor is a large roll of gauze. Our tables show 4 cases of prolapse of cord. All mothers recovered, but 3 of the children died—a foetal mortality of 75 per cent.

Impacted Shoulder Presentation.

Personally I have never employed the operation for this complication. It appears to me that it must be very seldom necessary or advisable. The slighter cases can be dealt with by deep anaesthesia and version, while the graver examples are better treated by decapitation, for by the time the labour has reached this stage the child's condition is generally far from satisfactory. It is possible, however, that occasionally a suitable case might arise where, owing to the excessively strong uterine contractions, impaction occurred relatively early. Our lists give 4 cases under this heading, with 2 maternal and 2 foetal deaths—50 per cent. for both mother and child.

Abnormal Conditions in Child.

Our tables show 11 cases where Caesarean section was performed for large size of the child, 4 for large head, 2 for occipito-posterior position, 2 for brow presentation, and 3 for impacted breech presentation—in all 22 cases, with no maternal mortality and a foetal mortality of 2—that is, 9 per cent. As far as these conditions are concerned, I feel certain that the majority of obstetricians would admit them as justifiable indications under special circumstances. The great difficulty with them is the determining beforehand the degree of dystocia likely to be encountered. In most cases, therefore, it is advisable to allow the labour to progress some way before deciding on such a radical procedure as Caesarean section. In some of the foetal conditions for which Caesarean section was performed the choice seems hardly justifiable—for example, hydrocephalus (4 cases), hydramnios (4 cases). Again, few of us would be prepared to accept foetal distress as an indication, unless there was some other complication.

Retraction and Contraction Rings.

Annular contractions of the uterus, in the neighbourhood of the upper or lower region of the "lower uterine segment" respectively, have received considerable attention in recent years. We are all familiar with contraction of the upper region of the lower segment—"Bandl's ring" or "retraction ring"—as an indication of impending uterine rupture. But in recent years we have been able to go further, for a number of writers have drawn attention to the fact that this ring may actually act as a barrier to the passage of the child out of the uterus—as, for example, in impacted breech presentation with extended legs. There have even been a few cases where the passage of the head has been arrested by the ring grasping the child's neck and preventing descent of the shoulders. Further, there have been a few cases reported where a distinct annular ring has formed at the lower region of the lower uterine segment, to which some writers have given the name "contraction ring." There are a number of cases on record where this ring has actually prevented the descent of the forecoming head. Probably more cases of this nature will be treated by Caesarean section in the future.

Rigidity of Cervix and Vagina.

I have placed this last in the list of indications, for, although we encounter a few cases in which Caesarean section is indicated—for example, old cicatrices seriously obstructing the passage—there are few who advocate the employment of such radical measures as Caesarean section for rigidity of the cervix, even when it is extreme. Personally, I wonder if we are wise in adopting this attitude. I have seen, and practically all here must have encountered, primigravidae where the parturitions were prolonged, sometimes for days, the vagina and perineum were extensively lacerated, the child bruised or dead, and the puerperium febrile, in whom if Caesarean section had been selected the results would have been infinitely better. Unfortunately, it is very difficult to predict the course of labour in a primigravida. In cases of this kind Caesarean section must be delayed until we can determine what the course of the labour is likely to be. Having determined that it is to be very prolonged and likely to be associated with considerable injury to mother and child, I personally feel convinced that it would be better to transfer such a patient to a nursing home or hospital and have her operated upon by Caesarean section. It is in this and in many other complications that the advantage of having all primigravidae in a nursing home or hospital is so apparent. There the patient, with vulva prepared as if for a surgical operation, with all appliances to hand, can be treated as is deemed best, and at any time Caesarean section can be performed with every confidence of success.

Grave Diseases Threatening the Life of the Mother.

Under this heading our tables show 42 cases of cardiac disease, with a maternal and foetal mortality of 20 per cent.; advanced pulmonary tuberculosis, two cases with no deaths; intestinal obstruction, four cases with two maternal deaths; and single cases of each of the following: diabetic coma, septicaemia, and chorea, all fatal.

I fear that in these remarks upon the indications for Caesarean section I have been unable in many instances to lay down definite rules for your guidance. There are few problems in obstetric practice which have a single solution; in most instances there are alternatives, and the wise obstetrician is he who is not prejudiced in favour of a special procedure, but selects the particular treatment after weighing the whole matter and drawing from his past personal experience. Further, he should decide his line of action early; vacillation in obstetric practice is fatal.

Our art is ever progressing. At no period of its history has it been so virile as to-day. I am quite convinced that twenty years hence, when the youngest here has become a senior, the accepted indications for Caesarean section will be extended even beyond the limits suggested in this paper.

METHODS OF PERFORMING CAESAREAN SECTION.

BY

EARDLEY HOLLAND, M.D., F.R.C.P., F.R.C.S.,

Assistant Obstetric Physician to the London Hospital; Obstetric Surgeon to the City of London Maternity Hospital.

THE objects of improving the technique of an operation are to reduce its mortality and morbidity, and thereby to extend the indications for its legitimate performance. The operation of Caesarean section has been standardized for the past forty years; in fact, the operation as almost universally performed nowadays is called the "classical" operation.

THE "CLASSICAL" OPERATION.

The technique of the classical operation was perfected nearly forty years ago; it was in 1882 that the tentative efforts of certain obstetric surgeons culminated in the publication of Sänger's important paper on the technique of suturing the uterine incision. Prior to this the uterine incision was not sutured unless to control unusual haemorrhage, for the surgeons of those days were fearful of leaving suture material in the peritoneal cavity. Sänger's method, with unimportant modifications, is that used by the vast majority of modern obstetric surgeons.

The classical operation has well stood the test of time, and deservedly, for it is extremely simple, and, with the general march forward of surgical technique, its mortality has been reduced to such an extent that it has become a very safe operation. In consequence no operation has in modern times had its list of indications so widely, and as some consider so recklessly, extended as Caesarean section.

Mortality.

I will first deal with the mortality of the classical operation: the safer an operation is, the more often is it performed and the greater is its list of indications. Striking testimony of this is got by comparing old with modern figures. For the old figures I have relied on the second edition of Spiegelberg's textbook, published in the year that suture of the uterus was becoming common practice. His estimate of the mortality of the operation at the date he wrote (1882) was at least 50 per cent. With this huge mortality, the indications for the operation were correspondingly small. In fact, there was only one indication: when delivery by the natural passages was impossible—as from absolute pelvic contraction, obstructing pelvic tumours, or carcinoma of the cervix. As regards the conditional indication for performing the operation in degrees of pelvic contraction other than the absolute (that is, in pelves with a conjugata vera above 2¼ in.), Spiegelberg writes: "The question in actual practice amounts to this: Are we to sacrifice the mother for the sake of the

child?" and again, "The *conditional* indication can alone be legitimate if he (the accoucheur) feels convinced that the mother is willing to sacrifice her life for the sake of her child."

How different are the modern figures and the modern indications. For these we turn to what we all consider a great landmark in the history of Caesarean section—Dr. Amand Routh's well-known investigation "On Caesarean section in the United Kingdom," published in the *Journal of Obstetrics and Gynaecology of the British Empire* for January, 1911, which gave the results of Caesarean sections performed in the United Kingdom down to 1910. Here we see an amazing reduction in the mortality, accompanied naturally by a corresponding extension in the indications for the operation. The reduced mortality was not due to a radical change in the technique of the operation, for that had remained much the same, but to two factors of vital importance, the relative value of which is hard to estimate—namely, the general improvement in aseptic surgical technique and the fact that patients were operated on before or soon after labour had started, or in the early stages of obstetrical complications—not, as in the old days, only as a last resort when already in a dangerous state. The figures got by Amand Routh for cases of contracted pelvis operated on between 1891 and 1910 were as follows:

Condition.	Cases.		Maternal Death.		Percentage.	
1. Not in labour	245	469	9	14	3.6	2.9
2. In labour, membranes intact ...	224		5		2.2	
3. In labour, membranes ruptured...	166	230	18	40	10.8	17.3
4. Frequent examinations or attempts at delivery	64		22		34.3	

The standard mortality of the operation *per se* is got by taking clean cases of contracted pelvis—that is, women not in labour, or in the early period of labour when no vaginal examinations have been made.

As for the indications, in great contrast to the one and only indication of forty years ago, in Amand Routh's paper they make a formidable list of seventeen; and still an ever-growing list, containing all sorts of fancy and flimsy indications, such as breech presentation in primigravidae, delayed first stage of labour, mild cases of toxaemic albuminuria, and so on.

I now come to the figures obtained by the collective investigation initiated by Professor Munro Kerr and myself. We felt that during recent years the problem of Caesarean section had undergone considerable changes, and that accurate information was badly wanted in several directions; we therefore invited the obstetric surgeons at all the large centres in Great Britain and Ireland to send us, on tables provided for the purpose, their hospital figures for Caesarean sections performed from the years 1911 to 1920 inclusive. Their response to our proposal has been unanimous, with the result that we are now in possession of the results of about 4,000 recent Caesarean sections performed for various indications. Time has not allowed us to make a full analysis of these figures, but we are able to give certain results of great interest. The total number of cases in which the operation was performed for pelvic contraction is 3,374. These have not all been reported in sufficient detail to enable them to be placed in precise categories, but the following groups of cases stand out:

Condition.	Total Cases.	Maternal Deaths.	Percentage.
A. Not in labour	1,202	19	1.6
B. Early in labour	389	7	1.8
C. Late in labour	224	24	10.7
D. After induction of labour	35	5	14
E. After attempts at forceps delivery...	103	28	27

The cases in the above table number 1,953. Classes A, D, and E naturally gave no trouble in their selection. Class B comprises cases very early in labour, and their selection from the tables rested on such attributes as the following: "early in labour," "at onset of labour," "labour commenced," "in labour for two hours" (I have included no case where labour had lasted for more than six hours), "labour began in hospital," "membranes intact, os two shillings," "operation of election during first stage," "some pains," and so on. Class C comprises cases very late in labour, cases at the other end of the scale to Class B; their selection depended on such notes as "membranes ruptured many hours," "prolonged labour before operation," "Bandl's ring present," "tonic contraction of uterus," "long (days or many hours) in labour, membranes ruptured," "labour advanced, and cord prolapsed," "several hours in labour, several examinations and manipulations," and so on.

The remaining 1,421 were cases in labour which either did not fulfil the requirements of Classes B and C, or in which the details given were not sufficient to enable them to be classified. The total number of maternal deaths is 134; of these, 80 are accounted for in the above table; the remaining 54 occurred amongst the 1,542 unclassified cases.

The cause of maternal death is an important consideration, and was stated in 124 cases to be as follows: general peritonitis 50, septicaemia 27, pneumonia 15, pulmonary embolism 9, cardiac failure 9, haemorrhage 8, intestinal obstruction 5, acute paralytic ileus 1. It is clear that sepsis is paramount as the cause of death. In Class C 11.7 per cent., and in Class E 28 per cent., of the foetuses were delivered dead—what one would expect after the application of forceps; two *post-mortem* examinations I have made in such foetuses revealed cerebral haemorrhage and tearing of the tentorium cerebelli. The important points brought out in this analysis are: (1) The mortality of the operation *per se* (that is, in Classes A and B) has fallen in a gratifying manner; in fact, it is only about half what it was amongst the cases collected by Dr. Amand Routh. (2) The mortality from sepsis for cases long in labour or after attempts at delivery remains almost as high as ever; in fact, the 27 per cent. mortality after forceps is a serious warning. (3) In the latter classes of case, when the operation is nearly always undertaken for the sake of the child, it is well to bear in mind that the foetal mortality is high. The heart of a foetus with cerebral haemorrhage will continue to beat so long as it is still in the uterus, and, indeed, for some minutes after delivery; it is the respiration that is paralysed.

The Defects of the Classical Operation.

Satisfactory as the classical operation has been and still is, there are certain disadvantages both in theory and in practice, and these have been coming much to the front lately. In fact, the present is a disconcerting period of unrest about Caesarean section.

The defects of the classical operation as met with in practice are the following:

1. The risk of sepsis in infected or suspected cases. The classical operation is not safe in cases where infection is suspected or present—that is, where labour is advanced and the membranes are ruptured, and where there have been many vaginal examinations or perhaps attempts to deliver by forceps.

2. The risk of rupture of the scar in subsequent pregnancy or labour. Quite apart from rupture of the scar, which is comparatively rare, the proportion of thin and defective scars which is found at subsequent operations is very high. Rupture of the scar was considered very fully last year; I found that the frequency of rupture in subsequent pregnancy or labour was 4 per cent., and that the proportion of ruptured scars to successful deliveries by the natural passages, in the series of cases I investigated, was 1 to 4.[1]

3. The risk, a rare one I admit, of intestinal complications during convalescence, an example of which was the case of intestinal obstruction due to the adhesion of intestine to the uterine scar, reported by Clifford White at the recent congress at Birmingham.

4. Adhesions between the uterine scar and intestine, omentum, or abdominal wall; these make sometimes a formidable difficulty in repeated operations.

Theoretically, there are certain very definite factors which militate against the healing of the uterine incision in classical Caesarean section, and favour adhesions to surrounding structures. These were admirably dealt with by Munro Kerr at the discussion at the Royal Society

of Medicine last year. They fall under three headings: (1) The structure of the uterine wall, through which the incision is made. (2) The position of the incision in the uterus, lying as it does in the general peritoneal cavity, and covered with intestines or omentum. (3) The liability of infection of the uterine wound; this is not only in possibly infected or "suspect" cases, but in clean cases also there is always a theoretical risk owing to the proximity of the uterine wound to a contaminated area—that is, the vulvo-vaginal tract.

The structure of the uterine wall through which the incision is made is a most serious disadvantage to perfect healing. It is made through a very thick layer of powerfully acting muscle. The contraction of this powerful muscle may interfere both with the accurate coaptation of the edges during suture and with subsequent healing.

Everyone knows how, during the stage of closure of the wound, the incision tends to gape transversely, and the edges are drawn apart when the uterus contracts. If the contractions are very powerful, small gaps, which become occupied by blood clot, inevitably occur between the sutures; or the sutures have to be tied so tightly that there is a risk of them cutting through the tissues. During the process of healing the essential condition for the healing of divided muscle is conspicuously absent—the wound is never at rest, for the uterine contractions are always trying to drag apart its edges. Many cases have been described in which it had been necessary to reopen the abdomen for haemorrhage, or which had come early into the *post-mortem* room, where the uterine wound was found widely open owing to the sutures having cut out or, in the case of catgut, to their having become untied.

Should infection of the uterine wound occur, accompanied by the formation of granulation tissue and sloughing of the edges of the incision, healing is delayed, and an imperfect and thin scar is bound to result, owing to the retraction of the muscular edges. These imperfect scars are found of all degrees—from moderately thin scars, consisting chiefly of fibrous tissue, to extremely thin ones composed merely of peritoneum outside and endometrium or decidua inside, with a little intervening fibrous tissue. The liability of such thin scars to rupture in subsequent pregnancy or labour is very great.

In the case of even mild infection the position of the incision makes adhesions between the scar and omentum, intestines or abdominal wall almost inevitable. Every obstetric surgeon has met with examples of this. Extreme examples are the cases of death from intestinal obstruction in the present series of collected cases, Clifford White's case, already referred to, and one of the five cases of ruptured scar I reported last year.

Some Points in the Technique.

It is easy enough to perform a classical Caesarean section, but the greatest care must be taken to suture properly the uterine wound. This is the step in the operation which is apt to be done imperfectly. There must be no hurry; every suture must be inserted and tied deliberately.

Suture Methods.—So long as the thick edges of the uterine incision are brought completely into apposition, and are kept in apposition during healing throughout their whole extent, it does not matter much what method is employed. The best method is, in my opinion, the usual one of passing interrupted sutures through the whole thickness of the uterine wall, except the decidua. An essential point is that the sutures should start well outside the edges of the incision, so as to include a good thickness of uterine wall. If the sutures are passed too closely outside the edges, when they are tied the edges tend to buckle and the line of the sutured wound is thinner than the natural thickness of the uterine wall. For this reason a well-curved needle is best, and the path of the needle should take such a direction as to include a wide bite of muscle. Any method of single interrupted suture which fails to take a wide bite is not good. For example, I do not consider the method of passing the needle just beneath the peritoneal edge is to be recommended. It is true that by this means a much more accurate closure of the peritoneal edge can be obtained, but this advantage is outweighed by the disadvantage of a thin bite.

Closure of the Uterine Peritoneum.—This is of great importance in preventing the leakage of sepsis from the interior of the uterus to the peritoneal cavity. If the usual method of interrupted through-and-through sutures which start wide of the peritoneal edge is employed, the covering of this layer by a superimposed Lembert peritoneal layer is often difficult to make perfect, especially if the uterus is contracting strongly and is well retracted. To overcome this difficulty I have adopted the following plan. I first incise the peritoneum only, throughout the length of the proposed incision. I then reflect the peritoneum for half an inch all round; this is surprisingly easy. The muscle is then incised in the usual way throughout the length of the bared area. In suturing the wound the muscular wall is sutured first; the reflection of the peritoneum allows of the needle being inserted well outside the edge of the muscle, so as to take a wide bite. After this layer is tied the reflected peritoneal edges can be accurately united, first by a running suture, and over that by a Lembert suture.

Wait for Retraction.—Another point I consider of importance is to wait for complete retraction before inserting the sutures; if the wound is sutured before retraction is complete and the muscular walls are thin, the result is bound to be a scar thinner than the rest of the uterine wall, for the sutures fail to include layers of muscle fibres which during complete retraction would have slid inwards and become rearranged, adding to the thickness of the sides of the incision.

The Suture Material.—As the result of my inquiry last year, as well as for theoretical reasons, I consider that silkworm gut is the best suture material, silk the next best, and catgut most unsuitable.

Most operators have their own pet method of suturing the incision, as well as other modifications in technique, but in spite of all, the classical operation remains, except for unimportant modifications, essentially what it was forty years ago.

The Lower Segment or Cervical Operation.

In spite of the great merits of the classical operation, many surgeons are not entirely satisfied with it, and have devised other methods of abdominal delivery which will avoid the defects I have already mentioned as inherent to the classical. These new operations can all be grouped together under the designation of "cervical" or "lower segment" Caesarean section. As long ago as the beginning of last century an operation was devised for opening the lower uterine segment extraperitoneally through an incision above Poupart's ligament; it was revived by the American surgeon Gaillard Thomas in 1870 under the name of gastro-elytrotomy, as an alternative to the ordinary route, in order to avoid the dangers of septic peritonitis. But the operative mortality was as high or higher, and it quickly dropped out when antiseptics and Sänger's method of suture came in and brought such good results.

But the lower segment operation with a greatly improved technique has lately been revived, and its chief exponent in this country is Munro Kerr. The many methods of performing the operation can be divided into extraperitoneal and transperitoneal. These I shall not discuss, but shall confine myself to the description of the simple transperitoneal operation.

The patient is placed in the Trendelenburg position and the abdomen is opened from the symphysis to near the umbilicus. The utero-vesical peritoneum is picked up and incised, and the bladder is dissected off the uterine wall, exposing the lower uterine segment. This reflection of the bladder is extremely easy, more especially in cases where the patient has been for some time in labour, and the bladder has followed the retracting uterus upwards; there should be no haemorrhage unless the bladder is dissected down too low. The lower uterine segment is then incised. Personally, I prefer a longitudinal incision, but Munro Kerr makes it transversely; perhaps their respective merits will come out in the discussion. The foetus and placenta are extracted and the uterine incision sutured; the muscle may be united either by a continuous or by an interrupted layer; over this another layer is used to close over the thick utero-vesical cellular tissue or fascia. The edges of the divided utero-vesical peritoneum are then united with a carefully placed continuous peritoneal layer.

Its Advantages.

I have employed this operation so far only nine times, and have been extremely pleased with it. Its advantages over the Classical are, I consider, the following:

1. The wound lies in a quiet part of the uterus, and is at rest during healing. There is no tendency for the edges of the wound to be drawn apart, or for gaps to be formed between the sutures. For these reasons healing occurs under more favourable circumstances than in the classical operation.

2. The uterine incision is made through a less vascular area, and bleeding from the edges is extremely slight.

3. The edges of the wound are thin; suture is therefore easier and quicker.

4. The position of the wound is such that adhesions to the intestines, omentum, or abdominal wall cannot occur; there is only a short line of peritoneal sutures at the bottom of the utero-vesical pouch.

5. The uterine wound is covered with a thick layer of fascia and by the bladder, and perfect closure of the peritoneum can be made. For these reasons there is less likelihood of infection of the peritoneal cavity; for it is generally conceded that the source of peritoneal infection is not so much due to contamination by liquor amnii or other uterine contents during the operation as to the subsequent passage of infection from the uterine cavity between the edges of the incision. Should peritoneal infection occur, the lower abdomen is more resistant than the upper.

6. The operation causes less disturbance of the abdominal contents; the intestines are never seen.

7. The scar is in a safer area for subsequent pregnancy and labour, for the lower uterine segment stretches late in labour. The stretching to which the scar is subjected is purely passive, for there is no powerful active drag upon each side of the scar, as there is in the scar of the classical operation.

8. As regards the performance of the operation, it is just as easy to a practised surgeon as the classical; true, there is more "operating" in it—it is not done, as it were, by two strokes of the knife, as is the Classical. The more advanced the patient is in labour, the easier will the operation be and the lower will the incision lie in the lower segment and cervix; in fact, in cases of excessive retraction of the uterus, the incision will lie partly in the upper end of the vagina.

9. So far only one case of ruptured scar has been reported, and this is not a fair case, as the upper end of the incision had to be extended upwards on to the body of the uterus. At the same time it must be remembered that very few lower segment operations have been done compared to the many thousand by the classical method.

Choice of Method of Caesarean Section.

It is obvious that a great deal more experience and careful recording are necessary before a sound opinion can be come to about the relative merits of the classical and lower segment operations. Personally, my future practice will be to employ the transperitoneal lower segment operation for all cases, except where the lower segment is hard to get at, as in cases of shortness of the abdominal cavity accompanying diminutive stature or kyphosis (where the presenting part of the foetus is jammed down against the pelvic brim) and in fibroids. I have had no experience of the operation in cases of placenta praevia. A more moderate view would be to use the operation only in cases where patients have been long in labour, when the operation is easier, and when infection of the uterine wound is to be feared.

Reference.

[1] *Proc. Roy. Soc. Med.*, 1920, vol. xiv (Sect. of Obstet. and Gyn.), pp. 22-124.

DISCUSSION.

Dr. W. Robinson (Sunderland) congratulated the readers of the two papers on their excellent summaries of the indications for, and of the technique of, Caesarean section. He was glad that the operation had not been recommended for nearly every variety of difficult labour, as the tendency now was, because it was so easy of performance and so dramatic in character. It was easy for the woman as well as the surgeon. One patient had said to him some days after an operation, "They all ought to come that way, doctor." He thought, too, that all first labours at least, and all in which complications were expected, should take place in homes or hospitals, so that the woman and child might have the benefit of asepsis and of surgery if required. For placenta praevia (central and marginal) the operation should be done in preference to turning—so fatal to many children. His experience made him opposed to the operation for eclampsia, or at least doubtful of its utility. The collection of the statistics up to date was a most valuable piece of work. That the operative mortality, in clean cases, by various surgeons should be as low as 1.4 per cent. was another triumph of modern aseptic surgery, but it must be taught emphatically that the safety of the procedure for patients actually in labour lay in operation before the membranes had ruptured, as certainly as did operation for acute appendicitis immediately after its onset. Delay spelt danger. He hoped that the low transverse extraperitoneal incision recommended to be used in all cases to prevent the occurrence of a subsequent weak scar, and the possibility of rupture in a future pregnancy, might occasionally prevent the fatal peritonitis which took place in some of those operated upon after the membranes had ruptured and frequent examinations or attempts at delivery had been made.

Lady Barrett (London) was very glad of the opportunity of congratulating Professor Munro Kerr and Dr. Eardley Holland on their extremely useful papers. What they had been able to give in the short time at their disposal only hinted at the vast amount of work they had done in preparing the statistics of all cases of Caesarean section since 1910. On the usefulness and safety of Caesarean section for cases of contracted pelvis all were agreed, and she would refer briefly to one or two of the other indications that had been discussed. Caesarean section in cases complicated by fibroids showed a surprisingly high mortality. She suggested that in cases complicated by fibroids, in which quite clearly the fibroid would cause obstruction to labour, the safer treatment would have been to remove the fibroid by myomectomy during the pregnancy, thus allowing a natural labour to take place at term. In Caesarean section for eclampsia, where the results also showed a very high mortality, it was not so easy, as was sometimes suggested, to distinguish the cases which were especially dangerous. Some cases in which Caesarean section was performed very shortly after the advent of albuminuria, and possibly with no other symptoms, might develop post-partum eclampsia and die, while advanced cases with almost total suppression of urine might have uneventful recoveries. She believed the mortality of Caesarean section for placenta praevia in primigravidae would be very much lowered by a united opinion that it was the right treatment; the mortality, she thought, was high just because doubt existed and so many of the cases were subjected to other attempts at delivery or to frequent examinations before the operation was performed. She heartily agreed with Professor Munro Kerr that accidental haemorrhage occupied a different position. If the abdomen was opened in accidental haemorrhage it was to perform hysterectomy instead of or after Caesarean section. The mortality of Caesarean section followed by hysterectomy in these cases was so high that she thought it should be rejected; hysterectomy alone should only be undertaken in extreme cases, because not only did the mother lose the present child but was deprived of the possibility of having others. Lastly, she would like to emphasize the usefulness of Caesarean section in cases of extreme heart failure, because delivery by that method subjected the patient to less effort and less shock than any other. She believed that a general anaesthetic for this purpose, such as open ether with oxygen, was more desirable than spinal anaesthesia. With regard to method, she confessed to having used the classical operation only, probably because she saw such bad results following the low incision in Vienna. Certainly morbidity had been high there in association with all methods, but it seemed to her particularly high in cases of the low incision. She rather doubted whether the drag on the wound in the more muscular part of the uterus was as great as Dr. Eardley Holland had suggested; if it were, it was difficult to imagine how, in the days preceding suture, any cases at all healed.

Professor WALTER SWAYNE (Bristol) drew attention to the fact that the class of cases with the highest mortality rate consisted of those in which attempts had been made to deliver in spite of an unrecognized obstruction. A large number of such cases could be avoided by more careful supervision and examination during pregnancy; although this would not prevent some cases coming into the category, there was no doubt that the number could be and ought to be diminished. He thought that for complications other than disproportion there was a tendency to make use of Caesarean section as a means of treatment without a clear idea as to the objects to be attained. Its indiscriminate application in such cases was to be deprecated and definite limitations should be laid down. He suggested that such an investigation as that carried out by Drs. Munro Kerr and Eardley Holland should be carried out at much more frequent intervals, say every two years, in order that all the workers in this field might have an opportunity of comparing their work and revising their methods. One great advantage of such an investigation as the present lay in the comparison of the conditions obtaining in different localities for which it gave opportunity. In the West of England, for example, contracted pelvis was relatively uncommon, while the other complications of labour were, in some instances, above the average. These local differences were important, since they had a direct bearing on the relation between the number of emergency and elective operations and produced differences in immediate indications and technique.

Mr. R. J. JOHNSTONE (Belfast) thanked the openers for the important work they had done in collecting the statistics of Caesarean sections, and joined in the hope that this work would be continued, say, for the next five years. He was himself a convinced supporter of the operation, and thought that the indications for it might be reasonably extended to many cases in which the life of the child was exposed to more than ordinary risk by the ordinary methods of delivery, as, for instance, in prolonged gestation, or in breech presentation in a primigravida with an abnormally large child. Such an attitude would be, of course, indefensible were it not clearly shown, as it had been, that in uninfected cases the risk to the mother was very small. He differed from Dr. Eardley Holland's view of the physiological activity of the uterus after parturition, and regarded it as being in a condition of mild tonus, rather than in active contraction. He thought the fears expressed as to the probability of obtaining a sound scar in the upper part of the uterus were exaggerated. He always used catgut for the suture, and put in three tiers of continuous suture. In over eighty operations he had had one case of rupture of the uterus.

Mr. GORDON LEY (London) congratulated Drs. Munro Kerr and Eardley Holland on their excellent and most valuable contribution. He was glad that Dr. Munro Kerr had emphasized the possibility of extending Caesarean section to those cases of prolonged labour with early rupture of membranes, one of the most troublesome complications in midwifery, particularly met with in elderly primigravidae. With regard to the action of the uterine muscle in inhibiting healing of the uterine incision, he could not agree with Mr. Johnstone. Surely, he said, the uterine contractions during the puerperium were similar in nature to those during labour—that is, they tended to make the site of union gape, as was seen at operation, and thus to inhibit healing. In two cases of laparotomy for spontaneous rupture of the uterus he had found the uterus partially inverted through the tear in the anterior wall. This emphasized the drawing apart action which was noted at operation.

Mr. BECKWITH WHITEHOUSE (Birmingham) said that the change of opinion during the past ten years with regard to resort to Caesarean section in the treatment of placenta praevia was extremely interesting. About ten years ago, at a discussion at the Royal Society of Medicine upon this subject, Dr. Henry Jellett had, he believed, made the statement that, "although he did not think the Caesarean operation wrong for placenta praevia, he could not see the necessity for it." This was the view expressed by the majority of speakers at that discussion. To-day the position was reversed, and Caesarean section was being advocated as the ideal treatment for central and lateral cases. Personally, he was in complete agreement with this view. The tendency had been, and by many practitioners still was, to regard placenta praevia as an obstetric complication which could be dealt with quite satisfactorily by version. If the mother was saved all was well, and the loss of the child was not considered. As a matter of fact, version in placenta praevia was not an operation free from danger to the mother, quite apart from the terrible foetal mortality. In statistics covering ten years at the Maternity Hospital, Birmingham, the maternal mortality in cases of version for placenta praevia amounted to over 4 per cent., whilst the foetal mortality reached the appalling figure of over 70 per cent. Institutional figures, in estimating the value of any method of treatment, were always the most reliable, since the personal factor was eliminated. There was little doubt that in placenta praevia a real difficulty was to define when Caesarean section should be done and when it should not be done. Were all cases to be treated by operation, and, if not, what was to be the guiding line? Mr. Whitehouse's own practice was to perform Caesarean section in all cases of central and lateral placenta praevia at or after the eighth month of pregnancy. The initial haemorrhage was the important symptom which should lead to examination and diagnosis and to immediate treatment. Personally, he would like it to go forth from the Section that placenta praevia was an obstetric complication which could only be dealt with satisfactorily in a hospital or nursing home, and one in which Caesarean section was very likely to be required. Version was not to be regarded as being an operation free from risk to the mother, and statistics did not place it on as favourable a basis as modern Caesarean section. He had performed the lower segment operation upon two occasions, according to the method advocated by Dr. Munro Kerr in 1920 at the Royal Society of Medicine. Each time, however, he had experienced some difficulty. At the first operation there was much troublesome venous haemorrhage from vessels in the lower uterine segment. On the second occasion considerable difficulty occurred in extracting the child. Apart from this criticism, the operation appeared to be based upon sound principles, and possibly these initial difficulties would disappear with further experience of the method.

Dr. J. WEBSTER BRIDE (Manchester) said that in response to Dr. Eardley Holland's request he had investigated the cases of Caesarean section performed in St. Mary's Hospital, Manchester, during the years 1911–1920 inclusive. The total number of cases in this period was 648, a very large number for one centre. The conditions which necessitated Caesarean section in these 648 cases, with the number of deaths and mortality rate, may be tabulated as follows:

	Cases.	Deaths.	Per cent.
Contracted pelvis	557	23	4.1
Eclampsia	15	10	66.6
Ante-partum haemorrhage ...	25	7	28.0
Other indications	51	10	19.6

There were 50 deaths in the 648 cases—a total mortality of 7.7 per cent. for the ten years.

In the groups "eclampsia," "ante-partum haemorrhage," and "other indications" the mortality was high, the cases being of a serious nature, often *in extremis* at the time of operation. Of the 23 deaths in the contracted pelvis group, 12 (that is, over 50 per cent.) were ascribed to general peritonitis. All except 3 of these 12 had been repeatedly examined before admission, the membranes were ruptured in all, and in 4 cases forceps had been applied at home. Of the 3 not treated at home by manipulations, 1 had albuminuria, 1 had chronic bronchitis and the abdominal wound had to be resutured, and 1 had no assignable cause for infection. Of the remaining 11 cases, 3 died of pneumonia, 2 of intestinal obstruction, 2 of embolism, 1 of chronic bronchitis and cardiac failure (no pyrexia), 1 of haemorrhage and shock (forceps before admission, moribund on admission), 1 of mitral stenosis (*post mortem*, warty vegetations on mitral valve), and 1 of exhaustion (forceps before admission). The mortality, then, from general peritonitis in cases of contracted pelvis in Manchester was 2.1 per cent.; all the 12 cases had been subjected to repeated vaginal examinations, or attempts at instrumental delivery had been made before admission, or there had been some defined cause for their infection, except in one case, in which there was no note of any such

interference or cause, though it was suspected that there had been such interference (at the time the note-taking was poor owing to the war). The conclusions to be drawn from the Manchester experience were:

1. That Caesarean section was performed with very little risk to the mother, save when, as Amand Routh emphasized, she had been subjected to frequent examinations, or attempts at delivery had been made.
2. Caesarean section in eclampsia had been most disappointing, only five cases recovering, but it had been probably done too late.
3. In ante-partum haemorrhage it was good, especially in cases of central placenta praevia in primigravidae, when the foetus was viable.
4. In tumours obstructing delivery it was often essential, and the results on the whole were good.

The number of Caesarean sections performed for contracted pelvis in Manchester was strikingly large. Through the courtesy of Dr. Ashby of the Manchester Children's Hospital, he was able to state that the number of cases of rickets seen at the out-patient clinic was fully 10 per cent. of the total cases—that is, 2,000 boys and girls; of these probably half were girls—that is 1,000 a year. This helped to explain the frequency with which Caesarean section for contracted pelvis was performed in Manchester.

The President, Dr. RANKEN LYLE, said: I desire on behalf of the Section to offer to Dr. Munro Kerr and Dr. Eardley Holland a most cordial vote of thanks for their extremely interesting and very learned papers. The writing and compilation of these papers must have entailed much hard work and thought, and we all most cordially congratulate both writers. When the committee selected this subject for discussion it had in mind two most important considerations: First, that there were no definite rules or indications laid down for the performance of Caesarean section, and consequently in many cases it was not performed when it might have been of great advantage, and in some cases it was performed when the indication for it was not very definite; and secondly, that owing to the rapidly improving results obtained, the operation was justifying its extension to many cases where hitherto the indications for it were not considered sufficient. The committee thought that by choosing this subject for discussion the Section would be able to lay down more or less definite indications which would act as an authoritative guide to all operators in the selection of cases for operation.

Dr. Munro Kerr, in his most able paper, has, I think, completely fulfilled the wishes of your committee. He has given a large number of indications, and has indicated in what cases he considers the operation should be performed and in what cases the operation is of doubtful propriety. I entirely agree with him in everything he has laid down, with one exception, and that is in cases of contracted pelvis. I consider that a true conjugate of 3½ in. should be a definite indication for Caesarean section at term rather than 3¼ in. He has shown that Caesarean section in eclampsia, although frequently performed, is not desirable on account of the very heavy mortality, and has also stated that more attention should be given to prophylaxis and medical treatment. With this I most cordially agree. There is only one other point I should like to criticize in his paper. He says that in those cases where one might anticipate a rupture of the uterus on a subsequent occasion the patient should be sterilized. I am not of this opinion. I am a strong supporter of conservative Caesarean section, and I do not think that any form of prospective trouble should be an indication for sterilization. In 1910 very few teachers in this country believed in absolute conservative Caesarean section. At the present time I think that nearly half the teachers in this country advocate it, and I believe that before many years it will be the unanimous opinion of the profession that conservative Caesarean section should be adopted in all cases.

Dr. Eardley Holland has taken an infinity of trouble in collecting and tabulating 5,000 cases of Caesarean section performed in this country during the last ten years. The results which he has shown in definite percentages are a most valuable guide to everyone as to the nature of the cases in which the operation is highly desirable, and of those in which the operation is of doubtful propriety.

The high mortality in the third and fourth classes—namely, patients very long in labour, patients after forceps, etc.—is, I have no doubt, going to be reduced very considerably in two ways: First, by the ever-increasing number of patients who are seeking institutional treatment, where the necessity for the operation will be either anticipated or discovered at a much earlier period; and secondly, by the extension of pre-maternity work all over the country.

I am deeply impressed by the importance and value not only of these papers but of the subsequent discussion thereon, and have no hesitation in stating that they mark a great advance in our knowledge of the indications for the performance of this operation. I again most heartily thank and congratulate Dr. Munro Kerr and Dr. Eardley Holland on their most valuable contribution to obstetrics.

THE TREATMENT OF ADVANCED CARCINOMA OF THE CERVIX OF THE UTERUS BY RADIUM.

BY

ARTHUR BURROWS, M.D.LOND.,

Radiologist, Manchester and District Radium Institute, Royal Infirmary, Manchester.

THIS paper deals with the treatment of advanced uterine carcinoma by radium, and I will not discuss the treatment of early carcinoma of the cervix of the uterus. Until within the last two years all cases which I have treated have been beyond operation, consequently any figures that I may give cannot fairly be compared with statistics showing the success or otherwise of Wertheim's hysterectomy. Every single case of apparently hopeless malignant disease saved or rendered operable by radium is a subject of rejoicing and hope, and much solid satisfaction can be obtained by contemplating the large number whose symptoms are made negligible for months or even years. Radium has not, so far, solved the problem of dealing effectually with the secondary deposits, although recent research shows possibilities in that direction, but of its great value in the treatment of carcinoma of the cervix of the uterus there is no doubt.

In the early days of radium treatment Wickham and those associated with him first treated cancer of the cervix by placing, for varying times, heavily screened radium applicators against the growth. They reported considerable success, but later the insertion of a strong radium tube into the cervical canal proved more beneficial. Still more recently the practice of burying a number of radium or radium emanation tubes in the cervical growth and those tissues round about it, which are actually invaded or liable to be so, has improved results still further.

At the present time I adopt one of two methods, and even after more than a year of comparison have not been able to make up my mind which is the better. There is no necessity for the heavy metal screening which has been employed by radiologists, but still the choice lies between a screened and an unscreened method of treatment. In no case need a screen thicker than 1 mm. of silver be employed, unless the huge doses (not available to most of us) used at Baltimore can be considered.

In the screened method at Manchester about seven tubes are inserted under an anaesthetic. A large one of about 50 millicuries of emanation (that is, 50 mg. of radium element) screened by 1 mm. of silver is introduced well up the cervical canal. Six other smaller tubes screened by 0.3 mm. of brass (previously platinum) are pushed into or about the cervical growth, care being taken to introduce two or three into the broad ligaments. The strength of each of these smaller tubes is about 15 millicuries. If consistently good results are to be obtained, a dose of never less than 120 millicuries for twenty-four hours must be given.

In employing the unscreened method I still use the large central tube mentioned above, but insert in the surrounding tissues small unscreened capillary glass tubes, each containing radium emanation of a strength of 2 to 5 and even occasionally 7 millicuries. They are inserted to the number of two to eight by means of an exploring syringe needle and stilette. No effort is made to withdraw the small tubes, but the large one is removed after twenty-four hours.

So far I think I may say that with practice and strict cleanliness there is no immediate danger in either method. In each case the vagina is packed with gauze after the insertion in order to maintain the tubes in position. Occasionally this packing produces retention of urine, and catheterization is necessary.

Douching should be performed daily after the operation—first and most important, to keep as clean as possible the reacting growth; and secondly, though not now so important since tubes have been buried and not merely placed in the vagina, to prevent the formation of vaginal adhesions.

There still appears to be considerable possible variation in the quantity of radium employed, its time of application, and the screening used—so much so that reports of successful cases, now coming from all over the world, often make one pause and think.

Cases for Treatment and Prospects.

In the treatment of inoperable malignant disease there is, of course, not a great deal of choice in the cases. The vast majority of those who come as hospital cases for examination with a view to radium treatment are put down for radium. But even for radium a few cases are worse than hopeless; they come with large secondary masses in the liver and abdomen; paralysed legs from deposits in the spine and the pressure of glands; while, locally, the large cloacal fistulous openings sometimes seen only remind one that all the troubles of patients dying from malignant disease should not be put down to radium. Such extremely advanced cases should be left alone, but they do not form more than 5 per cent. of those seen.

When cases are not so bad the outlook is not good. (1) When the growth is very large and hard. With adequate treatment it tends to slough, with inadequate treatment nothing happens to the patient's advantage. Large fungating growths do not matter—curettage may spare somewhat the small quantities of radium at our disposal, but I have not otherwise found it necessary. (2) Cases with very extensive infiltration of the vaginal wall rarely give a good result, even from the point of view of palliation. (3) I have yet to be convinced that the exact histology of the carcinoma is much help in the prognosis of cases, but of course those tumours which form metastases rapidly give the worst results, and it is probably for that reason that the outlook in women under 40 is bad whatever the stage of the disease, while the prognosis improves as the menopause is approached or passed.

For the best results cases just beyond operability, as might be expected, are the best, but the presence of some slight mobility of the uterus, a good blood supply to the tumour, and the slow formation of secondary growths, are all factors of good omen.

The more firmly the growth is adherent to the bladder and the greater the infiltration of the bladder wall and urethra, the more chance is there of a fistula resulting from the treatment; but the percentage is low (in fact, very little above that of untreated cases), and adhesion to the bladder by no means renders the case hopeless. I find that a recto-vaginal fistula is quite uncommon.

In estimating the immediate results of radium treatment, with an eye to the future progress of a case, a very high standard must be set. The patient in a so-called "symptomatic cure" should profess to feel perfectly well and to be absolutely free from pain or discharge. Examination should show the uterus to be quite mobile, while the cervix should be small, smooth, and any scar tissue soft and supple. Vague pain in the abdomen, back, or limbs, slight induration in the vault of the vagina, enlargement and hardness of the cervix, are all factors which promise recurrence.

It is interesting, however, to note that sometimes recurrence may not be manifest until so long a period as two years has elapsed.

Pathological Notes.

During the last two or three years, owing to the interest and help of the Manchester gynaecologists, I have been able to obtain microscopical examinations of a number of cases of carcinoma of the cervix which have been treated first by radium, the uterus being removed six to twelve weeks later. It is interesting to note that in most of the cases the growth in the cervix has completely disappeared and been replaced by the characteristic dense radiation connective tissue. Occasionally a few degenerate malignant cells are seen. One of my cases, who was killed in an accident six months after treatment, showed no sign at all of growth at the *post-mortem* examination. From this it would seem that, at least locally, radium can be and often is effective in its destruction of a cancer.

Statistics.

I propose to deal only with some figures from my own cases. All the cases dealt with in detail here were inoperable, and presumably surgical interference would have been useless. For further figures on the subject as a whole I must refer you to Dr. Janeway's valuable paper published in *Surgery, Gynecology, and Obstetrics*, September, 1919.

In 1915 I found that 10 per cent. of my cases of cancer of the cervix of the uterus showed no sign of disease at the end of the year. This figure has gradually improved with better technique, and, in spite of increasing number, has risen to nearly 30 per cent.

I have analysed in more detail the 100 cases I treated between April, 1916, and July, 1918. I have not gone earlier because I was then only using a single tube, but in 1916 I began increasing the dosage and the number of tubes employed. The figures, therefore, are taken as far back as possible in the early stages of more adequate dosage. The cases were treated between three and five years ago. Prior to that period I have been able to trace two cases which have been alive and well for over five years.

The hundred cases are divided as follows, and those who have tried to trace patients in numbers will bear with me in the deficiencies of the list:

6 are definitely well to-day and have been well from three to four and a half years (1 three, 2 three and a half, 1 four, and 2 four and a half years).
5 were well twelve months after treatment, but I have failed to trace them since.
7 were well three to six months after treatment, but have not since returned.
6 were rendered operable and operation performed.
32 were made quite comfortable and able to work from six months to two years. Some of these have died subsequently.
26 were not improved or died quickly.
16 cases I could get no information about at al
2 were given prophylactic irradiation.

This gives 6 per cent. who have definitely lived up to the present time and been well for a period of three to four and a half years. During the period analysed the number of cases traced to be apparently well at the end of the year was about 15 per cent. It is now nearly 30 per cent., so it seems at least probable that 12 per cent. of the inoperable cases of carcinoma of the cervix treated by radium at the present time will be alive and well in three to four and a half years' time. When to this 12 per cent. are added those cases which become operable and those which remain well for a considerable time and disappear, the record is, considering the present state of the therapeutics of cancer, a hopeful one.

But, apart from all the above facts, the radium treatment of cancer of the cervix is well worth while for its wonderful powers of palliation alone.

DISCUSSION.

Dr. W. Robinson (Sunderland) thought that if 12 per cent. of Dr. Burrows's patients with cancer of the cervix were alive and well three to four years after his treatment, much better results might be obtained if the same treatment were to be applied to early cases. He was not satisfied with the results of the radical cure of cancer of the cervix by panhysterectomy with removal of the pelvic glands. The operative mortality was still excessive, even in the most skilled hands, and serious complications (urinary fistula, etc.) frequently followed the operation. In the hands of some surgeons the pelvic tissues and glands were not removed *en masse* nor as completely as they should be, owing to the difficulty of the operation. As in only 30 per cent. of those dying from the disease were the lymphatic glands infected with cancer—the disease spreading generally by continuity of tissue and not by permeation—it was reasonable to expect eradication or

destruction of the disease by a less extensive procedure, if the cases could be operated upon in an early stage; he had, in fact, several such patients, alive and well, from whom he had removed a cancerous uterus many years ago by the vaginal method. Byrne's treatment by the actual cautery had been at least as successful as the knife, and his operative mortality was *nil*. Cancer cells were more easily destroyed by heat than normal cells, hence they were killed at a greater depth than the surface of the tissues to which the cautery had been applied. Byrne's figures gave hope of better results (less risk than by extensive dissection) by local treatment, by radium, etc., whose penetrating effects were greater than heat. One difficulty might be so to apply the needle-like containers as to make sure of destroying any deeper affected parts which were hidden from view.

Dr. H. E. Gamlen (Newcastle) found Dr. Burrows's paper very thorough, interesting, and instructive. As malignant disease of the uterus generally ended in death, it was his opinion that the only way to combat it was to discard most limitations and make a bold bid for its eradication by means of huge doses of radium. For many years he had been acquiring experience in the use of radium, but only within the last eighteen months had been possessed of a sufficiently large quantity to be of use in treating malignant diseases seriously. He was now working with 300 mg. of radium bromide or its equivalent. Most of his work in the treatment of malignant diseases of the uterus had been done under the supervision of an eminent gynaecologist, and a certain amount of success had been recorded. In some cases it was surprising how large growths of the os and cervix melted away after a few days' intensive treatment. Further success was obtained by the introduction of large doses of radium into the body of the uterus. Some of these cases for the time being appeared to be clinical cures, as no traces of the growth had been found. Quite recently some very fine radium needles had been acquired, and by their introduction into growths and surrounding tissues he felt optimistic of obtaining still better results.

Mr. W. Ernest Miles (London) said that at the Cancer Hospital he had many opportunities of observing the treatment of inoperable cancer of the cervix by radium, and had yet to see the case that had been cured by that means. Dr. Burrows said that the most favourable cases for radium treatment were those that were just inoperable. He would like to ask how that point was determined. In his experience it was often extremely difficult in borderland cases to say whether an operation was possible or not unless abdominal exploration had been carried out. It often happened that a growth, though apparently in an early phase and freely movable, was found, on opening the abdomen, to have given rise to widespread glandular and peritoneal involvement rendering operative interference impossible. Conversely, many growths, though seemingly fixed, were found, on intra-abdominal inspection, to be amenable to panhysterectomy. On several occasions he had been able to carry out a radical operation in apparently inoperable cases, and as a consequence the patients were alive and well to-day. It would seem, therefore, to be a pity to subject such borderland cases to radium treatment without having previously determined their inoperability by abdominal section. His experience of radium treatment had been that whereas in some instances a certain amount of regression might take place in the primary growth, the metastatic deposits were so stimulated to activity that rapid and widespread dissemination occurred.

Mr. Cecil Rowntree (London) said that the results described by Dr. Burrows were very striking, and compared most favourably with those of panhysterectomy; indeed, they almost approached those claimed by Erlangen himself. It was evident that his methods must be very different from those employed at the Cancer Hospital, for, in spite of the fact that they had, for a long time past, had quite a large supply of radium at their disposal, yet the results obtained had been bitterly disappointing; his experience, and that of his colleagues also, had shown that although temporary improvement sometimes occurred, yet this improvement was never maintained, and that in carcinoma of the cervix, as in all other forms of carcinoma with the exception of rodent ulcer, recrudescence of the disease invariably showed itself.

Mr. Beckwith Whitehouse (Birmingham) asked Dr. Burrows if he had had any immediate ill effects from the use of radium in large doses when applied to the cervix. In the experience of some, enteritis and colitis were not uncommon sequelae, and at least one fatal case had been recorded in a Continental medical journal.

Dr. Ranken Lyle, after thanking Dr. Arthur Burrows for his valuable paper, said that his own experience of the treatment of such cases by radium was very small. In association with Dr. Gamlen he had used it in about ten or twelve cases; in some the disease rapidly disappeared as if by a charm, but unfortunately returned in all except one case, which so far appeared to be still quite free from the disease. The results that Dr. Burrows had obtained from the use of radium were exceptionally good and most encouraging; those who had not so far obtained better results from this treatment should not be disheartened, because every inoperable case cured by radium was a positive triumph, and it was quite possible that before long the results from this treatment would improve as experience in its use grew.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

BRONCHOPNEUMONIA WITH PYAEMIC SKIN MANIFESTATIONS RESEMBLING SMALL-POX.

A boy, aged 8 months, was admitted to the Royal Hospital for Sick Children, Glasgow, on February 21st, 1921, with a history of having been unwell for seven weeks with "bronchitis." During the last fourteen days the cough had become more severe, and vomiting and fever were present. On admission the patient was much distressed, with an anxious expression, a pallid face, and his lips and fingers cyanosed. The temperature was 101.4° F., the pulse rate 156, and respirations 36 per minute. The skin showed a diffuse purpuric rash over trunk and legs. The lungs showed signs of consolidation at both apices and at the right base posteriorly. A skiagraph of the chest revealed a well-marked shadow over the lower part of the right lower lobe. The heart, abdomen, and throat appeared to be unaffected, all nervous reflexes were brisk, the von Pirquet test was negative, and, as regards the urine, no albumin was present and microscopic examination was negative. The blood examination revealed haemoglobin 90 per cent., red corpuscles 4,000,000, white corpuscles 50,200. Stained films revealed the leucocytosis to be one of mature polymorphs.

The child continued to be extremely ill, the general picture suggesting a septicaemia or perhaps an acute pyelitis rather than a pneumonia, although consolidation extended to the left base. Two days after admission a large patch of discoloration with a vesicle an inch long by half an inch wide appeared on the right foot. On March 7th (fourteen days after admission) a fairly profuse eruption appeared which closely resembled that of small-pox. The eruption was first noticed on the trunk, where, as well as on the inner aspects of the thighs, it was very profuse, whilst there were only some half a dozen spots scattered over the cheeks, and both upper extremities were entirely clear except for a few spots over the deltoid area. The eruption, which at first consisted of papules, then passed on to a vesicular, and in fact to a bullous, condition. Each vesicle, however, appeared to be unilocular.

Blood was taken from the longitudinal sinus and culture revealed abundant diplococci of pneumococcus type, some occurring as short chains. The urine was frequently examined for pus during the illness but none was found until the day before death, when a few pus cells were detected in a fresh drop of urine. Marked conjunctivitis developed towards the end of the illness, stained films revealing xerosis bacilli and also abundant Gram-positive cocci. The temperature remained between 99° and 100.2° F. until four days before death, when it rose to 102.4° F., and on the last day it was 103° F. The pulse varied from 120 to 160 per minute, and the respiration rate

from 30 to 50. Death occurred five days after the eruption appeared, the only change in the skin lesions being that many of the vesicles became definitely pustular in character.

Post-mortem Examination.

Lungs: Widely diffused septic foci and bronchiectasis throughout both lungs, but especially well marked in the right middle and in both lower lobes posteriorly. At the right base there was early abscess formation. *Kidneys:* Minute haemorrhages throughout, the appearance suggesting commencing foci of suppuration. *Liver:* Showed fatty degeneration. *Heart and Spleen:* Negative. *Skin:* Microscopical examination of the skin showed that in the immediate vicinity of the pustule there was intense capillary injection with abundant polymorphonuclear exudation. The whole thickness of the skin was infiltrated with polymorphs and there was also a considerable collection of oedematous fluid. The actual pustule was enclosed by the stretched keratinous layer and its contents were composed of pus, necrotic epithelial cells, and serous fluid. The lesion appeared to have taken origin immediately beneath the corium and to have spread through the thickness of the skin, and also to some extent laterally on the surface of the prickle cell layer but beneath the keratinous layer. Occasional small abscesses were seen in the subcutaneous tissues.

The picture, therefore, was one of septic bronchopneumonia with pyaemia, but the superficial resemblance of the skin lesions to those of small-pox was very marked and caused grave doubt for some time in the minds of those in charge, especially in view of the prevalence of small-pox in Glasgow at the time, but the following points enabled this disease to be eliminated.

(*a*) *Distribution of the Rash:* (1) This appeared first on the trunk, and, except for some half-dozen papules scattered over the chest, the face was exempt and there was no lesion on the forehead. (2) Both upper extremities were almost free from rash. It has been pointed out that if a well-marked rash is present and one entire extremity or one large surface of the body is free from the rash the condition is very unlikely to be small-pox. (3) On the lower extremities the rash was much more profuse on the proximal than on the distal parts.

(*b*) *Character of the Vesicles:* These were unilocular, and although many became pustular they varied very much in size and in the degree of pustule formation.

(*c*) *General Appearance of the Skin:* As a whole the skin was dull and atrophic, in contradistinction to the vivid appearance in small-pox with the marked inflammatory areolae around each vesicle.

I desire to thank Dr. Leonard Findlay for permission to publish the case. I am also indebted to Dr. Haswell Wilson for details of the *post-mortem* examination and pathological findings.

J. B. DOUGLAS GALBRAITH, M.B., Ch.B.,
Extra Dispensary Physician, Royal Hospital for Sick Children, Glasgow.

SODIUM BIBORATE IN EPILEPSY: THE RESULTS OF TWELVE MONTHS' TREATMENT.

IN the BRITISH MEDICAL JOURNAL of October 9th, 1920, I published an article on sodium biborate in the treatment of epilepsy in an asylum. That paper recorded the combined treatment with potassium bromide and borax for a short period only—for four months in two wards of the asylum, and for six weeks only in two others, with the exception of one case (J. D.), in which the treatment was commenced in December, 1919. The following notes give the results in those patients who have had the treatment for a year and the number of whose fits for the twelve months prior to treatment is definitely known. I append below notes on the treatment of patients in four different wards in this asylum, and, although excellent results could be quoted from the remainder of the patients, I consider that the following notes are sufficient to show the value of this treatment. The only adjunct to treatment by potassium bromide and borax was a laxative given at bedtime.

Ward I.

The epileptic patients in this ward are all chronic cases, and their ages range between 39 and 50. All have been in the institution for years, and all were formerly on bromide alone. They were usually in a stuporous condition, and always more so after a bout of fits. In most of the cases it is difficult to obtain a proper history before admission, but in four patients in this ward there is a definite history of epilepsy—for thirty years in one case, for twenty-seven years in another, for twenty-two years in a third, and for twenty-one years in the fourth. All, except one who had *petit mal*, suffered from major epilepsy. The record in the ward is that there were in the year before treatment 1,086 fits, while during the year of treatment the number has been 222, an average reduction of fully 79 per cent. In regard to the case of *petit mal* the result is very striking; this patient has been epileptic for twenty-seven years, and is now 50 years of age. During the twelve months before treatment he had 404 fits; his number for the past year is 18, a reduction of fully 95 per cent.

Ward II.

The patients in this ward have been in the institution for from four to six years. They are between the ages of 25 and 43, but their epilepsy is of long duration, one case being epileptic from the age of 3½ years, according to the history given by his mother. The number of fits in this ward prior to treatment was 203. This has been reduced to 47, a reduction of fully 76 per cent.

Ward III.

The record here, although good, would no doubt have been much better had it not been that in this ward, by way of experiment, the treatment was discontinued at times in a few of the most typical epileptics; at intervals the dosage was altered, and at other times borax alone, and bromide alone, were administered. Despite these facts, the record is that the fits have been reduced in number from 534 to 247, or fully 53 per cent. One patient of the demented type, a man 55 years old, is worthy of comment. His intelligence was extremely poor, he was resistive, with marked irritability, and, in fact, everything had to be done for him. His record of fits has diminished from 127 to 67, and he is now to be found invariably in good humour, does nearly everything for himself, while his power of observation is remarkable as compared with his former state.

Ward IV.

The results in this ward are very satisfactory, the average reduction in the fits being fully 72 per cent., the total being reduced from 294 to 80. The ages of the patients here range between 35 and 71; the one patient of the latter age has not had an attack since he commenced treatment on July 20th, 1920, although in the previous year he had 42 fits of severe type.

In conclusion, besides the marked mental changes, the reduction in fits, and the great diminution in accidents and the amount of sedative which was previously required, the following points are worthy of notice: Periodical, violent, explosive outbursts have disappeared, and no longer does a stuporous condition follow the fits. There has not been a single case of status epilepticus in this institution during the past twelve months.

Hartwood, Lanarkshire. JOHN MCCARTNEY, L.R.C.P. and S.E.

CHOLECYSTOSTOMY AND CHOLEDOCHOTOMY FOLLOWED BY CHOLECYSTECTOMY TEN YEARS LATER.

THE following notes concern a patient, a married woman, who was aged 47 at the time of the first operation, upon whom I performed cholecystostomy and choledochotomy in 1910, and ten years later had to perform cholecystectomy. Her family history was unimportant, and her medical history was quite good, except that she had an operation for haemorrhoids in 1902. In 1884 she married her first husband, who died in 1910, and to whom she had three children. She first began to have biliary trouble in South Africa in 1905, and from that time onwards to October, 1910, she had repeated attacks of biliary colic, which were becoming a burden to her and affecting her general health.

I performed the first operation on October 11th, 1910, in the North Lonsdale Hospital, Barrow-in-Furness. The abdomen was opened, adhesions were found about the gall bladder area, and the gall bladder was adherent to the duodenum. The adhesions were separated, giving a better view of the parts. Then the gall bladder was opened, and 26 stones removed. On examination the common duct was found to be filled with gall stones, and the common duct was also opened, from it and the hepatic ducts 51 gall stones of varying size being removed. Three drains were left, one in the gall bladder, one in the common duct, and a cigarette drain in the kidney pouch. She left the North Lonsdale Hospital on November 8th, 1910.

From the date of leaving hospital after her first operation up to 1920 the patient enjoyed excellent health, while in the meantime her first husband died, and she married again in 1914. Early in 1920 she began to have pains in the gall bladder region, which became gradually worse and more frequent. She again asked for something to be done, as the attacks were beginning to make life miserable for a second time.

She was for the second operation again admitted into the North Lonsdale Hospital, and operated upon on August 23rd, 1920. The parts were somewhat obscure from the adhesions following the previous condition and first operation, but the gall bladder was exposed and opened; a large stone three-quarters of an inch long, triangular in shape, with the apex embedded in the cystic duct, was found, fixed and surrounded by adhesions, and obviously the gall bladder had ceased to be of use. The whole organ with stone *in situ* was therefore excised, the cystic duct ligatured and buried under the peritoneal cover of the liver,

which was sutured over the bed of the gall bladder. No drain was left in the abdomen. The abdominal stitches were removed on September 2nd, 1920, and the patient left the hospital on September 18th. Since leaving the hospital she has been perfectly well.

John Arthur Reed, O.B.E., M.B., Ch.B.,
Honorary Surgeon, North Lonsdale Hospital, Barrow-in-Furness.

Reviews.

GENERAL PATHOLOGY.

The appearance of Professor Oertel's *General Pathology: an Introduction to the Study of Medicine*[1] recalls a similar work by his distinguished predecessor in the chair of pathology at McGill University, Montreal, Dr. J. G. Adami, now Vice-Chancellor of Liverpool University, especially as the present incumbent is contemplating a second volume on the diseases of special organs and systems. His objects in this volume are, in the first place, to divest the study of pathology of all metaphysical and teleological conceptions of use, harm, defence and vital forces, and to show that pathological processes are physical and chemical cellular alterations and disturbed cell relations which follow ordinary biological laws, and, at least in the majority of cases, have a definite anatomico-histological expression. The author lays special stress on these structural changes, as they provide visual conceptions which furnish the most satisfactory understanding of cell functions, and insists that pathological anatomy remains the pillar of pathological science. The author's second aim has been to trace the historical development of our present ideas and, by showing the influence of one step of thought upon the succeeding, to cultivate a critical judgement for future use.

In a philosophical preface, after briefly sketching the history of pathology until Virchow's influence had transformed the subject, the author comes to the conclusion that it is impossible to give an exact and all-embracing definition, as distinct from a description, of health and disease. The first part of the book deals with etiology, and under the heading of external factors descriptions are given of the various pathogenic bacteria and protozoa. In a chapter on immunity it is pointed out that Ehrlich's ideas, being purely chemical, can no longer be maintained in their entirety, because the processes of immunity are now recognized as largely physical, colloidal, and electrical reactions. A summary is given of the physical and chemical factors of disease, such as heat and cold, air pressure, *x* rays, and poisons. The internal factors—namely, disposition and idiosyncrasy and heredity—are then considered; the belief in the transmission of acquired characters is rejected on the ground that no conclusive evidence has as yet been furnished to show that in the metazoa environment does anything but shape and develop latent qualities.

The second part of the volume deals with pathological processes—namely, the morphological changes and the pathogenesis; it contains five chapters, the last of which is on general somatic death. The chapter on pathological changes in local cell relations describes inflammation, the infective granulomas, and tumours; inflammation receives a carefully discussed definition as an expression of the sum-total of all those genetically related degenerative, exudative, and productive processes that are excited by irritants, some of these processes being individually destructive, others helpful. The specific etiology of Hodgkin's disease (lymphadenoma) is regarded as doubtful, on the ground that many attenuated infections may produce similar pictures. Hypernephroma is placed under the heading of special tumours of epithelial glandular tissue in company with chorio-epithelioma, and is thus separated from mesothelioma—a term which is restricted to neoplasms arising from the endothelium of the serous membranes; this is a change from the original previous significance of the term mesothelioma, which also included tumours of the adrenal cortex, ovary, and testes.

The concluding words of this clearly and succinctly written work, which thoroughly deserves success, may be quoted: "The cultivation of pathological anatomy and histology is to-day, as it was in the days of Morgagni, Bichat, Bright, and Virchow, the essential foundation for the science and practice of medicine."

[1] *General Pathology: an Introduction to the Study of Medicine.* By Horst Oertel, Strathcona Professor of Pathology, McGill University. New York: Paul B. Hoeber. (Demy 8vo, pp. 357 + xxi; 12 charts. 5 dols.)

GUY'S HOSPITAL REPORTS.

The third instalment of this year's quarterly issue of the *Guy's Hospital Reports*[2] contains nine articles, four being on the alimentary canal, and thus showing the inspiration of the successful editor, Dr. A. F. Hurst, who indeed is joint author of two of these four papers. In collaboration with Mr. R. P. Rowlands he contributes a very complete account of jejunal and gastro-jejunal ulcers; jejunal are twice as common as gastro-jejunal ulcers, which may contract or even obliterate the stoma, and hardly ever occur in association with gastric carcinoma. Ulcers are more frequent after gastro-jejunostomy for duodenal ulcer, in which hyperchlorhydria is constant, than after operation for gastric ulcer, in which hyperchlorhydria is rare, though hypersecretion occurs if the pylorus is involved. The presence of free hydrochloric acid is not enough to cause these ulcers, the additional factor being some infective focus—for example in the mouth, or even a suture. These ulcers are usually chronic, but they may be acute and even perforate in a fortnight. The prophylaxis and treatment of a fistula—especially of a gastro-jejuno-colic fistula—are clearly described. The editor's other contribution, with Professor T. B. Johnston, on left-sided colon due to non-rotation of the gut, is illustrated by figures explaining the mechanism of this rare abnormality. Drs. T. Izod Bennett and J. A. Ryle supply an elaborate study of normal gastric secretion based on investigation of a hundred healthy medical students by means of the fractional method of gastric analysis.

A detailed report is given by Dr. E. P. Poulton of a case of sino-auricular heart-block following pneumonia, and accompanied by a permanent rise of 125 mm. Hg in the systolic blood pressure within two years. Consideration of the bearings of this case on the genesis of the heart beat suggests that the auriculo-ventricular node normally initiates the ventricular beat, and is excited by an extrinsic current from the sino-auricular node, which arrives in front of the auricular excitation wave.

Mr. E. G. Slesinger, surgeon-in-charge of the fracture department, writes fully on a consecutive series of 458 cases of fracture of the upper limb treated as out-patients; and Mr. Philip Turner, in a note on the measurement of shortening after fractures of the lower extremity, points out the importance of the head of the fibula as a bony landmark, and shows how shortening due to a fracture of the shaft of the femur can be accurately estimated, and how inaccuracies due to a different position of the hip-joint on the sound and injured sides can be eliminated by measuring the distance between this point below and the top of the great trochanter above. In a paper on acholuric jaundice Dr. Campbell records cases of inherited and acquired chronic haemolytic jaundice, and then gives the history of a family with 9 cases and 30 normal individuals. Among the families collected from literature he found 53 cases out of 163 persons, almost equally divided between the sexes. It is difficult to understand the inheritance on Mendelian lines; in some families there is a tendency for the condition to die out in the fourth generation, which would negative the view that it is a real hereditary abnormality, and suggests the possibility of an attenuated infection, though the existing evidence is against such an explanation. This interesting number of the *Reports* also contains short papers by Mr. P. Briggs on hour-glass constriction of the stomach by the splenic flexure of the colon distended by gas, and by Mr. N. E. Kendall on some results of intranasal operation for antral suppuration.

[2] *Guy's Hospital Reports.* Edited by A. F. Hurst, M.D. Vol. lxxi (Vol. i, Fourth Series), No. 3, July, 1921. London: Henry Frowde and Hodder and Stoughton. (Pp. 253-375; 52 figures. Price, single numbers, 12s. 6d.; subscription for volume of four numbers, £2 2s. post free.)

A PRACTITIONER'S REFERENCE BOOK.

The subtitle of *Lippincott's Quick Reference Book for Medicine and Surgery*,[3] by Dr. George Rehberger, of the Johns Hopkins University, is "a clinical diagnostic and

[3] *Lippincott's Quick Reference Book for Medicine and Surgery.* By George E. Rehberger, A.B., M.D. Philadelphia and London: J. B. Lippincott Company. 1921. (Sup. roy. 8vo, 151 figures; 30 plates. 63s. net.)

therapeutic digest of general medicine, surgery, and the specialities, culled extensively and intensively from modern literature, and systematized." It is a bold and comprehensive as well as a lengthy claim, but on the whole, after looking up a number of subjects and studying the way in which they are handled, we are not disposed to consider it unjustified. The amount of information supplied as to diagnosis, causation, prognosis, and treatment has usually been found very satisfying. In respect of the general contents, the whole field of medicine and surgery is divided into eleven parts (not including a pharmacological index and section on weights and measures), separated from one another by marginal thumb-notches, and in each of these parts the subjects considered are arranged alphabetically. Cross-references are numerous, but despite this fact we have not invariably dropped quickly on to the article dealing with the disease entity we had in mind, and on this account rather regret the absence of a general index. We have no doubt, however, that with longer experience of the book this relative difficulty would largely disappear, and that the practitioner using it would agree that the compiler has attained his object. This has been to accomplish a critical sifting of modern literature, to select what is useful and needful in bedside therapeutics, and rearrange this mass of knowledge for purposes of quick reference and individual completeness of treatment of each subject, thus making it immediately available for practical needs. Dr. Rehberger claims nothing in the work as his own, except its plan, the selective judgement employed, and the labour involved. It is a compilation, in fact, of modern medical teaching—coloured, perhaps, by being written from the standpoint of a man who at one time in his life was an isolated country doctor and feels that he knows the needs of those liable to be confronted with disease in all its manifestations, and consequently in need of complete knowledge. As he truly points out, a practitioner who consults a single authority is not seldom disappointed by the lack of certain information which he deems of importance, and which he may, on further search, succeed in finding in another work. Sometimes, indeed, he would like to consult many authorities, but has not the means or the time at his disposal; this book aims at doing for him what he would like to do for himself had he the necessary facilities. The volume contains a large number of engravings and some thirty coloured plates.

METHODS OF EXAMINATION IN INSANITY.

DR. ANDRÉ BARBÉ has managed to compress a large amount of useful information into his unpretentious little volume, *Examen des Aliénés*.[4] He has made an exhaustive summary of the literature relating to objective and biological researches in the sphere of mental medicine in order that we may be in a position to estimate the extent of our actual knowledge in respect to this aspect of insanity. He stresses the view that intellectual functions are not independent of the bodily functions of the organism, but, on the contrary, are closely related to and dependent upon them. During the last few years laboratory methods have made such progress that they have rendered it possible to trace mental disorders to their true origin, and to demonstrate the relation between mental states and the conditions of the physical organization. In successive chapters the author gives a summary of the newer clinical and biological methods of investigation as applied to the nervous system, the cerebro-spinal fluid, the circulatory apparatus, the blood, the urinary system, the respiratory and digestive apparatus, the osseous system, the glands and internal secretions, intoxications and infections. All these sections include full references to the French and foreign literature of the subjects with which they are concerned. The author is of the opinion that the clinical study of mental disorder must remain stationary in the absence of definite facts to establish, or even attempt to establish, a classification, and he feels that, at present, psychiatry is in an almost anarchical state as a result of a want of understanding of the meaning, significance, or limits of the terms which it employs. Such a state of affairs, he believes, is most likely to be remedied by strictly objective laboratory studies.

[4] *Examen des Aliénés, Nouvelles Méthodes Biologiques et Cliniques.* Par André Barbé, Médecin Aliéniste des Hôpitaux de Paris. Preface by Dr. Séglas, Médecin de la Salpêtrière. Paris: Masson et Cie. 1921. (Demy 8vo, pp. xiv + 178. Fr. 8.)

The well-known psychiatrist of the Salpêtrière, Dr. J. SÉGLAS, provides an introduction to this volume. In a few pages he writes many words of wisdom, and he especially emphasizes the view that the student who launches himself into psychiatry must not too quickly narrow his horizon, but must bear in mind that if later he becomes administrator, psychologist, or expert, it will always be necessary that he should show himself a physician in the most general sense of the word; for psychiatry is, perhaps, of all the specialities the least specialized.

CHEMICAL ANALYSIS OF THE BLOOD.

DR. VICTOR C. MYERS has provided in his *Practical Chemical Analysis of the Blood*[5] a valuable addition to the laboratory bookshelf. As he says, it is to America that we owe many of the simpler tests and methods of bio-chemistry. The time has not yet come for any exhaustive treatise on chemical blood analysis, and the author confines his seven chapters to non-protein nitrogen and urea nitrogen, uric acid, creatinin, blood sugar, carbon dioxide combining power, cholesterol, and the chlorides. Within these limits and within the further limit of 120 pages a very great deal of useful information is concisely arranged. Since this branch of chemistry is young, the author does well to lay stress on normal variations and on the circumstances which make each test desirable. He writes as for readers who require the clearest and most orderly descriptions, and concludes his book with a very useful appendix, which contains, amongst other matter, directions for the preparation of standard solutions and reagents.

In the very nature of things a book of this sort must need frequent revision, and we hope that in subsequent numbers the writer may see his way frankly to include in his title chemical analysis of the urine. This important subject can hardly be divorced from chemical analysis of the blood, as almost every page bears witness.

CHEMISTRY OF PHARMACEUTICAL PREPARATIONS.

Organic Medicinal Chemicals,[6] by M. BARROWCLIFF and FRANCIS H. CARR, is one of a series each member of which is to deal with a special branch of industrial chemistry. The editor, Dr. S. Rideal, states in a general preface that an attempt will be made to appeal to "the very large class of readers already possessing good textbooks, of which there are quite sufficient." In the volume before us that aim has been very well achieved, for it presents a survey of manufacturing processes in comprehensive form, affording the reader a better grasp of the principles sought than he could otherwise obtain without repeating the authors' labours. It is written more expressly for the use of those interested in the manufacture of medicinal products, and is composed in the style of a manufacturer's pharmacopoeia; the articles are arranged, however, not in alphabetical order, but are grouped in sections of which the headings denote the therapeutic purposes of the preparations; this plan will help the student of chemical constitution in its relation to physiological action. Though the book deals chiefly with methods of preparation, fairly complete descriptions are given also of the chemical properties and physiological activities of the substances. The incidence of impurities receives full attention, and methods for their recognition are described. The authors' preface to the volume acknowledges a want of completeness in some descriptions of processes, due chiefly to the insufficiency of published accounts. Such a lack of completeness was from the first inevitable, and must in the nature of the case be a constant defect in a work of this kind, unless, indeed, enterprise in this branch of manufacture is to stand still; but that view being recognized, it may be said at once that the work is throughout full of practical and advantageous information. Abundant references to original publications are given. There are phrases in the text untrammelled by the rules of syntax; one reads, for instance, on page 42, "The

[5] *Practical Chemical Analysis of Blood.* By Victor C. Myers. London: Henry Kimpton. 1921. (Roy. 8vo, pp. 121; 13 figures. 16s. net.)

[6] *Organic Medicinal Chemicals (Synthetic and Natural).* By M. Barrowcliff, M.B.E., F.I.C., and F. H. Carr, C.B.E., F.I.C. London: Baillière, Tindall and Cox. 1921. (Demy 8vo, pp. 347; 25 figures. 15s. net.)

components are reacted at as low a temperature as possible . . ."; but the matter itself is manifestly the work of men who understand the science and technology of the subject. The work is to be regarded as a pioneer in this sphere; it will no doubt fulfil a useful purpose and in future editions come to occupy a position of authority.

A serviceable and authoritative treatise on the analysis of drugs and medicines has long been wanted. It is a field of chemistry in which the personal factor of the analyst has ever been large in comparison with that obtaining in other branches of laboratory work. It was hoped that Mr. FULLER'S book, *The Chemistry and Analysis of Drugs and Medicines*,[7] would contain matter that would reduce the personal element of success in practice, but this hope has been disappointed. It collates the methods given by pharmacopoeias, and in particular by the United States pharmacopoeia, for the quantitative determination of the active constituents of drugs and also methods applicable to unofficial substances. It contains descriptions of the properties and reactions of alkaloids, glucosides, and other chemical substances, including synthetic medicinal products, and has a section dealing with inorganic substances; attention is paid also to means of recognition and separation of the constituents of certain classes of compounded remedies. The matter is voluminous rather than well selected, and the arrangement is somewhat indefinite. Under aconite (p. 26), aconitine is erroneously described as ethyl-benzoyl aconin, and in the section dealing with alkaloids (p. 266) rightly as acetyl-benzoylaconin. Under acetic acid we read, "Acetic acid is the bane of the analyst in determining alcohol in drug mixtures. The writer has found it consistently in almost every alcoholic distillate . . ."; and under ethyl alcohol (p. 539), "The writer in checking over the work of other men has more than once saved an over-zealous chemist the chagrin of having to refute his analysis in contest when he had erroneously reported a definite percentage of methyl alcohol without making a qualitative test." Solicitude of this kind for the reader's inexperience runs throughout the book, but only rarely appears opportune. The book will be appreciated for the abundance of its contents. Few articles of materia medica or medicinal usage have escaped descriptive notice or reference within its pages; even chewing-gum receives more than 1,000 words. The analyst engaged in the examination of medicinal articles will find not only matter which he would otherwise have had to seek through scattered sources, but also details of the results of special research, as examples of which may be mentioned the work from English laboratories of Garsed on the coca alkaloids, and Farr and Wright on colchicine.

NOTES ON BOOKS.

SOME three years ago we drew favourable attention to the monograph on the conduction of nervous impulses, produced by Dr. E. D. ADRIAN from the material left at his death by the physiologist KEITH LUCAS. A French edition of this work has now been published.[8] It contains all the original diagrams, and the translator, M. GEORGES MATISSE, has also, we observe, contrived to adhere to the phrasing of the original text with remarkable fidelity. The translation, in fact, is usually so close that any possessor of the original might use the two as a textbook on how to write on a scientific subject in either language.

It is to be concluded from Professor FREUD'S introduction to *The Psychology of Day-Dreams*[9] that its author, Dr. J. VARENDONCK, has filled a gap in the literature of psycho-analysis. The contents are described by the latter as a contribution to the study of the mechanism of thinking, and in effect they appear to be an attempt to trace the source, connexion, and course of the ideas that floated through the writer's mind at various half-awake half-asleep periods during his service as an interpreter in the British army in the late war; and to apply the conclusions to thought at large. The general phraseology is unusually clear, and although the writer is a Belgian the English is excellent.

Professors EDWARD DAVIS and BEAMAN DOUGLASS, of the New York Post-Graduate Medical School and Hospital, have published a second edition of *Eye, Ear, Nose, and Throat Nursing*,[10] which first appeared some fifteen years ago. Beyond revision the principal alteration appears to be the introduction of a chapter dealing with vaccine and serum treatment. The book takes a broad view of the duties of a nurse in connexion with diseases and injuries of the organs in question, and the authors do everything they can to secure that she shall understand not only what she must do, but also why it should be done. The precise effect, for instance, of the various medicaments used is explained, and the motives which lead the specialist to prescribe sometimes one, sometimes another, are set forth. The writing throughout is clear, and no nurse who had carefully studied the volume could fail to take an intelligent and even critical interest in her cases. The book, in short, is one of the best on a nursing subject with which we are acquainted. It contains, also, so many illuminating observations on the treatment and progress of cases coming within the scope of the title, as to make it likely to serve as a useful reference book for any practitioner who does not habitually have to deal with them.

In *Bandages and Bandaging for Nurses*,[11] Miss CORDELIA COWAN, President of the State Board of Nurse Examiners in Colorado, and also nursing superintendent of a hospital, gives a succinct and clear account of the art. The brevity of the instruction is rendered possible partly by the omission of anything in the nature of *obiter dicta* and by the use of short numbered sentences, and partly by taking full advantage of the facilities offered by modern photography. There are, in fact, about four excellent pictures for every five pages of mixed text and illustration.

MEDICAL SICKNESS ANNUITY AND LIFE ASSURANCE SOCIETY.

THE annual meeting of the Medical Sickness Annuity and Life Assurance Society, Limited, was held at the offices of the society, Lincoln House, 300, High Holborn, W.C., on September 26th, under the chairmanship of Dr. F. J. ALLAN, when the first annual report of the society since its conversion into a mutual company was presented.

The report, which covered the period from May, 1920, to June, 1921, showed that 302 new policies had been issued and that sickness claims amounting to £20,007 had been paid. The total premium of the sickness and accident fund amounted to £41,066, and at the close of the period the fund had a balance of £218,074. In the life assurance fund 90 policies had been issued assuring £59,000 gross, and the total amount of the fund was £34,754. The total premium income of the society amounted to £47,431, while the expenses of administration was 11.2 per cent. of the premium income. The rate of interest earned was £5 3s. per cent. gross and £3 19s. 6d. per cent. after deduction of tax. After allowing for a further £5,000 to be transferred to the investment reserve to meet the continued depreciation of trustee securities there was an increase of £21,673 in the two funds, which now amounted to £312,828.

Chairman's Address.

The Chairman in his address congratulated the members on the success which had attended the conversion of the society into a limited liability company, under which it was able to do larger business. At present they were doing more business in a week than in a month under the old régime, and with a view to further expansion the meeting would be asked to sanction application being made to the High Courts for increased powers.

In the sickness fund the new annual premiums were nearly three times the average amounts of previous years; the claims made for sickness and accident were well within the expectation, and averaged £6 per member, which was about the same as in the previous year. The cost of administration of the fund had slightly risen, being now 12 per cent. of the premium income, but it compared favourably with other companies who were spending double or even treble that amount in administration of the same class of business. The life insurance department showed gratifying signs of expansion. The new system, which he believed the society was the first to introduce, of premiums not being loaded for profits, but policy holders being entitled to them, had proved

[7] *The Chemistry and Analysis of Drugs and Medicines.* By H. C. Fuller, B.S. New York: J. Wiley and Sons, Inc. London: Chapman and Hall, Ltd. 1920. (Med. 8vo, pp. 1081. 55s. net.)

[8] *La Conduction de l'Influx Nerveux.* Par Keith Lucas; publié par E. D. Adrian. Traduit de l'Anglais par Georges Matisse. Paris: Gauthier-Villars et Cie. 1920. (Demy 8vo, pp. 123; 22 figures. Fr. 3.50.)

[9] *The Psychology of Day-Dreams.* By Dr. J. Varendonck; with an introduction by Professor Dr. S. Freud. London: Allen and Unwin, Ltd. 1921. (Med. 8vo, pp. 367. 18s. net.)

[10] *Eye, Ear, Nose, and Throat Nursing.* By A. Edward Davis, A.M., M.D., and Beaman Douglass, M.D. Second revised edition. Philadelphia: F. A. Davis Company. 1920. (Post 8vo, pp. 351; 32 figures. 2.50 dols. net.)

[11] *Bandages and Bandaging for Nurses.* By M. Cordelia Cowan. Philadelphia and London: W. B. Saunders Co. 1920. (Demy 8vo, pp. 177; 139 figures, 10s. 6d. net.)

attractive. The expense of administration in this branch was only 5.84 per cent. of premium. This small cost was largely accounted for by the fact that no agents were employed to whom commission had to be paid. The amount of new business far exceeded anything the society had previously done. As the result of not paying commission agents the assured received a direct bonus on every premium paid for sickness and accident equivalent to 15 to 20 per cent., and for life assurance 2½ to 5 per cent., which amount would have had to be added to the premiums if agents had been employed.

The increase of work since the conversion of the society had necessitated the directors meeting every week instead of monthly, to deal with the various problems that arose; it had also necessitated an increase in the staff, to whom the society were indebted for the admirable way in which it had carried on the work. He regretted to report that ill health prevented Mr. Edred M. Corner from continuing to serve on the board. The expenditure of the society slightly exceeded that of 1919; this was partly accounted for by the higher price of everything, for expenses consequent on conversion, the payment of directors' fees, and, on account of the amount of new business, the greater number of fees paid to the medical men who examined proposals for assurance.

The values of trustee securities had shown further depreciation, necessitating an increase in the investment reserve, which now stands at £25,000. The directors had thought it desirable to make special provision for endowment assurances—the number of which were increasing—by investing in stocks redeemable at fixed dates. This had the double advantage that the money to meet such claims was readily available while the value of the stock improved as the time for redemption drew nearer. The society's policies for sickness contained no harsh restrictions and covered all accidents and sickness. Though permanent incapacity was not large, he called attention to the fact that 1 per cent. of their members were receiving regular weekly allowances on that account, and not infrequently the sum received from the society was the only source of income.

The Chairman concluded his remarks by moving that the report of the directors and the statement of accounts be received. The motion was seconded by Dr. W. K. SIBLEY, and, after the Chairman had replied to various questions, was carried.

Dr. Harvey Hilliard was re-elected a director, and Dr. Charles Buttar was elected to fill the vacancy on the board of directors caused by the resignation of Mr. Edred M. Corner.

Messrs. Harber, Sturges, and Fraser were reappointed auditors.

This concluded the proceedings of the annual general meeting, which was followed by extraordinary general meetings, when it was agreed to apply to the High Courts for permission to extend the scope of the society's work, and also to alter the present article of association governing the directors' fees. These matters were carried by the requisite majority, and will come up for confirmation at a second extraordinary meeting on October 17th.

HYPERNEPHROMA OF THE OVARY.

THE tumours of the kidney and ovary, to which the unhappy term hypernephromata is applied, and their relation, if any, to the adrenals, present a pathological puzzle of no little interest and complexity. The interest lies partly in the fact that true primary growths of the adrenal gland are attended by certain sex changes—namely, precocious growth and hirsuties of the male type, often by obesity, and often by hypertrophy of the external genitals, particularly of the clitoris. To this condition Professor Glynn of Liverpool has applied the term "suprarenal virilism."

Grawitz in 1883 put forward the suggestion that certain tumours of this order found in the kidney arise from adrenal rests, and the theory was extended to tumours of similar structure which occur occasionally in the ovaries. Grawitz's theory of the origin of the renal tumours has been criticized by, amongst others, Stoerk, Zehbe, and Wilson and Willis, as well as by Glynn, who have sought to demonstrate that the so-called hypernephromata of the kidney rarely, if ever, arise from adrenal rests. In a recent elaborate paper[1] Professor Glynn carries the controversy a stage further, maintaining that the so-called ovarian hypernephromas have never been proved to exist, and that on embryological grounds their existence is, if not inconceivable, extremely improbable.

In the BRITISH MEDICAL JOURNAL for October 18th, 1919 (p. 495), Dr. Kuyvett Gordon described two cases of ovarian hypernephroma. Shortly afterwards (November 8th, 1919 (p. 616), his diagnosis was challenged by Dr. Leith Murray, and finally, on January 24th, 1920 (p. 133), was published a histological report by Professor Turnbull on the two cases, and another to which Dr. Gordon had alluded; the decision was that the supposed hypernephromata were really tumours of the lutein body, and Dr. Gordon admitted that his original diagnosis was wrong. Professor Glynn gives three reasons for doubting whether any true case of ovarian hypernephroma has ever been described. His first reason is embryological, and rests upon the fact that there is no established instance of adrenal rests having been found in the ovary, though they are known to occur in the broad ligament. The difficulty obviously is to distinguish adrenal rests from lutein tissue; the resemblance, both to the naked eye and microscopically, is close. The ovaries are seldom carefully examined at necropsies on adults; and even if structures resembling adrenal rests were found, they would, without further investigation, not unnaturally be put down as lutein tissue. We know of no large series of foetal ovaries that have been examined for adrenal rests. The foetal ovary is an extremely small structure, and such an examination, to be thorough, would not be free from difficulty; even if yellow bodies were found, they would not necessarily be adrenal rests, as mature Graafian follicles and corpora lutea have been seen even in the ovaries of newly-born infants. In Jessup's case, quoted by Glynn, tissue resembling adrenal cortex (zona glomerulosa and fasciculata), with a rich capillary network dividing the cells into rows or cords, was found in the ovary of a newborn infant; probably this was an example of a real adrenal rest, rather than of a corpus luteum; a rich capillary network, and the arrangement in narrow columns, are much more characteristic of adrenal cortex than of normal corpus luteum, and there is no suggestion that the latter was in any way abnormal. On the whole we are inclined to think that the argument, from embryological grounds, has not been established with absolute certainty.

Professor Glynn's second reason is histological; the large ovarian "hypernephromas," he says, are unlike the large primary growths of the cortex of the adrenal gland itself, but are like the large lutein tumours both clinically and histologically. He has collected eight cases of so-called ovarian hypernephroma, and has found that the published descriptions show little if any difference macroscopically between them and primary growths of the adrenal cortex. In both there was a marked tendency to haemorrhage and necrosis, but in the adrenal group there was no cyst formation. There is a very close resemblance microscopically between the normal corpus luteum and the adrenal cortex; it will therefore readily be understood that in malignant growths arising in these tissues, and with more or less well marked anaplastic tendencies, the task of distinguishing between them will be extremely difficult.

Of the eight cases of ovarian hypernephroma cited by Glynn, two (Scudder's and Rosthorn's), in which the growths occurred in both ovaries, may be at once rejected. There was probably a primary focus elsewhere than in the ovary, the existence of which was overlooked. In a third case (Santi's) the left kidney contained an encapsuled white yellow growth as big as a fist, and was, as Glynn points out, undoubtedly an ordinary renal hypernephroma producing a metastasis in the ovary. There remain the cases of Peham, Peham and Paultauf, Sternberg, Gaudier, and Vonviller. In the photograph reproduced to illustrate Peham's case the cells are strongly suggestive of corpus luteum both in their general appearance and in their arrangement. They were occasionally arranged, however, to form gland-like lumina, and it may be suggested that lumina are more likely to be found in tumours arising from the adrenal than in luteomata. Several observers, Grawitz and Marchand amongst others, have maintained that lumina may be present in suprarenal tumours; Kölliker, Stilling, and Eberth have described lumina in the normal human adrenal, while in the adrenal of the horse and cow, lumina appear to be constant. There would seem, therefore, to be insufficient ground for asserting that tumours showing the presence of lumina are on that account not of adrenal origin, and there is no

[1] A Comparison between Ovarian "Hypernephroma" and Luteoma and Suprarenal Hypernephroma, with comments on Suprarenal Virilism. *Journ. Obst. and Gyn. Brit. Emp.* Spring, 1921.

obvious reason why such structures should appear in lutein tumours. It must be admitted, however, that in Peham's case the appearance of the cells and their arrangement suggest origin from a corpus luteum rather than an adrenal rest. In the case of Peham and Paultauf the crenated borders of the nodules and the presence of cysts are quite characteristic of luteomata. In Sternberg's case the tumours were cystic, though the cysts were said to be degenerative, and occasional gland-like structures were seen. This case may possibly be a hypernephroma, but there is no clinical history and its nature is by no means proven. In Vonviller's case the microscopic appearances closely resembled those of hypernephroma. Gland-like structures were absent, and the one cyst was degenerative. The most important case is perhaps Gaudier's, in which a girl aged 4, whose breasts and external genitals were those of an adult, had for three months suffered from menorrhagia and metrorrhagia, and simultaneously an abdominal swelling appeared. The left ovary was removed for a pedunculated tumour the size of a very large orange. Macroscopically it was yellow and surrounded by a fibrous capsule which sent vascular trabeculae into its substance. The tumour cells were polyhedral and contained fat. After considerable difficulty it was decided that it was "very probably a hypernephroma and not a lutein tumour, partly because the characteristic buds of vascular connective tissue dividing the polyhedral cells into large compartments were absent; instead, the compartments were slender and like those of the adrenal cortex; and because very occasionally the cells were arranged in hollow epithelial columns."

Glynn brings forward strong arguments in favour of this being a luteal tumour, the chief being the absence of what he has named "suprarenal virilism." Apart from this the histological descriptions are strongly suggestive of a suprarenal origin.

In 4 of the 8 cases, therefore, the diagnosis of hypernephroma does not seem to have been absolutely excluded either on embryological or on histological grounds. In respect to his third argument—namely, the clinical one—Professor Glynn would seem to be on safer ground. His position is briefly this: All true primary growths of the adrenal gland are attended by the changes to which he has given the name "suprarenal virilism," and he asserts that in no case of ovarian hypernephroma did the characteristic abnormalities appear. Bulloch and Sequeira in 1905 pointed out that in children in whom precocious development of hair on the face and genitals, with premature development of the genital organs and accessory genital glands, occurred either carcinomata (hypernephroma) or hypertrophy of the renal capsules was found, and that primary blastomata of the suprarenal glands unassociated with precocity were usually lymphosarcomata. Guthrie and d'Este Emery concluded that the cause of the precocious development was probably increased internal secretion from the adrenal cortex, though this was contrary to the usual rule that tumour formation is in general associated with diminution of function of the cells concerned.

In girls and boys suprarenal virilism seems invariably to accompany adrenal hypernephroma. In women before the menopause they appear, according to Glynn, in at least half the cases, while in women after the menopause and in adult males no striking changes occur.

The absence of suprarenal virilism with ovarian hypernephroma would thus seem at first sight to be decisive evidence against the origin of such tumours from adrenal rests. It is, however, a fact that no such changes have ever been recorded as occurring in Grawitz tumours. This is a difficulty that Glynn frankly recognizes, and meets with the contention first advanced by him in 1912, that the so-called renal hypernephromas are really not of that nature and do not originate in adrenal rests in the kidney; no actual case of adrenal rest in the kidney has, he concludes, ever been met with. If this be true, the absence of suprarenal virilism with their renal tumours is, as Glynn says, really a "most striking corroboration of the clinical argument." It is of importance therefore to examine the arguments for and against the Grawitz theory.

The adrenal cortex is developed from the mesothelium of the Wolffian ridge, which also gives rise to the ovary and testis. The renal cortex is derived from the renal blastema, which lies some distance below the adrenal, and is separated from it by the Wolffian body. Though the position of the early adrenal is not at first favourable to the inclusion of its tissue in the kidney, yet after the second month it is closely applied to the kidney and surrounds a large part of the renal body. Inclusions in the kidney may therefore reasonably be assumed to result. Robert Meyer, a careful observer, describes the occurrence of diffuse adrenal tissue without encapsulation in the kidney, while total subcapsular location of both adrenals has been observed by Klebs, Grawitz, Willis, and Ulrich. Fusion of adrenal in the renal capsule, and intralobular inclusion of rests surrounded by renal parenchyma are described by Grawitz and Ulrich. Glynn, on the other hand, has examined over 1,500 kidneys in the *post-mortem* room, and "remembers meeting with nodules resembling adrenal rests only in two instances." Both were found on microscopic examination to be papillary cyst adenomata. It seems probable, however, that such rests, if not specifically looked for by means of multiple sections of the kidney, might be easily overlooked in an ordinary *post-mortem* room examination, especially as rests may occur in the capsule and hence be stripped off with it. Ewing, after a careful examination of all the evidence, comes to the conclusion that the presence of adrenal rests in the kidney has been fully attested; that they occur with moderate frequency, though less frequently than Grawitz and his followers have supposed; and that the opponents of the Grawitz theory have gone too far in practically eliminating the adrenal rest as a source of renal tumours.

If, then, such rests occur adrenal tumours may arise from them, and the difficulty is to explain why such tumours do not give rise to signs of suprarenal virilism. Clearly it is here that the battle must be fought for the existence or non-existence of ovarian hypernephromas. If renal hypernephromas exist in young children and in women before the menopause without giving rise to sex changes, then there is no reason why the absence of such changes should exclude ovarian hypernephromas, and the main argument against the existence of the latter falls to the ground. Three possibilities suggest themselves to explain the absence of sex changes in renal hypernephroma:

1. That no case of this has ever been met with in children or in women before the menopause.
2. That the sex changes in adrenal hypernephroma are due, not to hypersecretion from the newly-formed tumour tissue, but to *hypo*secretion from destruction of the adrenal by the new growth.
3. That the adrenal cortex has only indirectly to do with sexual development by a reflex influence upon some other endocrine gland—for example, pituitary, pineal, ovary or testicle.

With regard to the first, if adrenal rests occur in the kidney, it seems extremely unlikely that no tumour derived from them has ever occurred in children or in women during sexual life, and yet no case of suprarenal virilism in such has been reported in the literature. With regard to the second suggestion, Weisel has reported a case of a girl of 18 in whom hypoplasia of the adrenals was associated with delayed development of sex characters, while Karakascheff refers to two cases—one in an adult female, the other in an adult male—in which atrophy of the adrenals was associated with a like condition of the genital organs. Hutchison has described a case of hemihypertrophy in a child, aged 4 months, associated with enormous hypertrophy and hyperplasia of the suprarenal body on the same side. Bulloch and Sequeira have pointed out that simple hypertrophy of the suprarenal is associated with pseudo-hermaphroditism; and finally it has been shown that in the anencephalic foetus, when the suprarenal glands are defective or absent, there is also hypoplasia of the ovaries, though this may be due to the accompanying hypopituitarism or apituitarism. It is probable, therefore, that it is a hypersecretion that is responsible directly or indirectly for the sex changes.

The third suggestion—namely, that the secretion of the cortex of the adrenal is only indirectly responsible for the changes—would account very well for their absence in all tumours derived from adrenal rests, whether in kidney, ovary, or elsewhere. The intimate connexion between the cortex of the gland and the chromaffin cells of the medulla, derived from the sympathetic, lends some support to this theory that the cortical secretion may act only by reflexly stimulating the secretion of other organs, possibly by regulating their blood supply.

In conclusion it may be said that Professor Glynn, by the present elaborate and painstaking paper, as well as by his former writings, has advanced very considerably our knowledge of such tumours as those under discussion. Our opinion is that while the existence of ovarian hypernephromata has not been so far proved, yet it has not been shown that such tumours have never occurred. There is room for much further research, both clinical and pathological, on this subject, with careful observation and investigation especially of possible ovarian and of renal hypernephromata occurring in young children. It is of the greatest importance to determine whether renal or extrarenal tumours of this nature really occur in the latter, and if so, whether they are associated with signs of suprarenal virilism.

British Medical Journal.

SATURDAY, OCTOBER 1st, 1921.

AURICULAR FIBRILLATION.

A very common cause of cardiac failure is auricular fibrillation, and in spite of the fact that this condition is now well described in the literature, there are still many medical men who fail to recognize its presence. This is of all the more importance since satisfactory treatment of cardiac failure often depends upon clear recognition of this common form of arrhythmia. In most instances a careful clinical examination, irrespective of special instruments of precision, is sufficient to justify a positive diagnosis.

It is well to remember that fibrillation is not necessarily associated with any particular form of cardiac lesion or with any age period. It sometimes occurs owing to sudden physical effort in those whose hearts are apparently sound. More usually, however, it is associated with valvular disease, rheumatic in origin, or with arterio-cardio-sclerosis. The important thing to recognize is that in essence it is a disorderly action, which may be superimposed on any heart affection, and is in itself a grave handicap.

It is in patients with auricular fibrillation that digitalis produces its most dramatic results. By the exhibition of this drug the rapid disorderly action of the heart is modified and the ventricle is compelled to beat at a more leisurely rate, with corresponding improvement in the condition of the patient. Unfortunately, however—except in rare instances—fibrillation of the auricle, when once firmly established, persists, and the object of the investigations which have been carried out in recent years has been to find some method of terminating this abnormal rhythm. These efforts are at last proving successful. In 1914 Wenckebach published evidence indicating that quinine possessed the power of terminating paroxysms of fibrillation, and since then much work has been carried out in order to determine the nature of this action and the salt of quinine which gave the best results.

We publish this week from the medical school of University College, London, two papers on this question which are of exceptional interest and value. As Sir Thomas Lewis and his co-workers say: "The action of quinidine sulphate upon the fibrillating auricle is perhaps one of the most remarkable and dramatic which is now known to therapeutics"; for by the action of this drug fibrillation is terminated and the normal action restored. The great significance of such a statement is obvious. In these two papers details are given of the treatment of 13 patients suffering from fibrillation, and in 6 of these the normal rhythm was restored. This is in keeping with the work of other observers—50 per cent. being the usual percentage of successes.

In the Oliver-Sharpey Lectures of this year Sir Thomas Lewis demonstrated that in fibrillation of the auricle there existed a "circus movement" of the auricular muscle. By the term "circus movement" was meant the passage of a wave of contraction which spreads through a ring of muscle fibre—as, for example, round the ring of muscle surrounding one of the orifices of the auricle—the rate of this contraction in auricular fibrillation being approximately 450 to the minute. For a continuation of this circus movement it is obviously essential that the advancing wave of contraction should find immediately in front of it muscle fibre capable of responding to stimulation. The muscle fibre in front of the advancing wave must not be in a state of refractoriness.

It was pointed out in these lectures that any drug which by its action increased the refractory period of the auricular muscle would tend to close the gap between the oncoming wave of contraction and the fibre still refractory; as Sir Thomas Lewis observed, it is essential to find some drug that acts in this way in order to bring the fibrillation to an abrupt conclusion. Quinidine sulphate proves to be a drug which possesses this power. It tends to close the gap and thus terminate the circus movement, and enables the normal pacemaker to resume its dominance. It is difficult to over-emphasize the practical importance of this discovery. The suggestion made by Sir Thomas Lewis and his co-workers as to the reason why the drug fails in something like half the cases will be read with interest; their warning as to the care with which, in the present state of knowledge, it should be used would appear to be timely.

FORMS OF VIRILISM.

The word virilism, briefly defined in the New Oxford Dictionary as a form of hermaphroditism, and with but one quotation attached—"they can be referred to infantilism and virilism" from *Natural Science* in 1896—has only recently been introduced into clinical medicine, apparently by Gallais in 1914 to describe the somatic conditions associated with hypernephromas arising from the adrenal cortex; his phrase suprarenal virilism has quite recently been adopted by Professor E. Glynn,[1] and may, perhaps, supersede the older but little used designation "masculinism." A full account of Professor Glynn's paper is given at p. 531, but further reference to it is justified by the interest of the subject.

The association between cortical hypernephromas and precocious development of the genitals and hirsuties was first convincingly established by Professor W. Bulloch and Dr. J. H. Sequeira[2] in 1905; in the following year Drs. L. Guthrie and Emery[3] insisted that precocious obesity is another feature of this syndrome, which, they stated, is not pathognomonic of cortical hypernephromas, but may accompany tumours of other endocrine glands, or even occur without any such gross change; they also stated that premature hirsuties may appear without any other signs of sexual maturity. Achard and Thiers,[4] in an interesting communication on hairy virilism and its association with sugar intolerance—"the diabetes of bearded women"—give a very comprehensive meaning to "virilism," using it as a term which, like "masculinism," can be applied to the collection of sexual characters that gives to the female the morphological and functional attributes of the male. Thus, in a well marked example, such as is seen with cortical hypernephroma, hirsuties with the distribution characteristic of the male, hypertrophy of the clitoris, atrophy of the mammae, a manly voice, and obesity or (in boys) muscular development, are present. But there is much variation in the degree of these manifestations. It is obviously influenced by the age at onset; thus, when the change commences in foetal

[1] E. Glynn, *Journ. Obst. and Gyn. Brit. Emp.*, Manchester, 1921, N.S., xxvii, 23-68.
[2] W. Bulloch and J. H. Sequeira, *Trans. Path. Soc.*, London, 1905, lvi, 189-202.
[3] L. Guthrie and d'Este Emery, *Trans. Clin. Soc.*, London, 1907, xl, 175-202.
[4] C. Achard et J. Thiers, *Bull. Acad. de Méd.*, Paris, 1921, 3e Sér., lxxxvi, 51-56.

life and both adrenals show hyperplasia, there is feminine hermaphroditism, the internal genital organs being female and the external approaching those of the male; whereas when a cortical hypernephroma starts after birth and is unilateral the manifestations are less pronounced. Pro essor Glynn has collected seventeen cases, verified by necropsy, in girls showing precocious growth, hirsuties usually of the male type, often obesity and hypertrophied clitoris, between the ages of 1 and 11 years, most being between the ages of 3 and 7. Professor Glynn also refers to four cases in boys with corresponding changes, except that in some there was remarkable muscular development (Parkes Weber's infant Hercules type); when the onset occurs after puberty the main features are amenorrhoea, sexual disorders, hirsuties and obesity. Professor Glynn quotes Dr. Gordon Holmes's remarkable case of a girl, formerly normal, who developed suprarenal virilism at the age of 20, and at 24, after removal of a hypernephroma, again became normal. After the menopause, hypertrichosis and obesity are the results.

Although suprarenal virilism is the best recognized form, it is by no means the only one, and it is possible that the mechanism by which cortical hypernephromas produce these striking changes is indirect; it may be that adrenal over-activity influences the genital glands, particularly their interstitial cells, thus leading to the somatic alterations. Disturbance of the balance between the various endocrine glands must therefore be taken into account in considering the etiology of virilism. A few cases of virilism have been reported in association with pineal tumours (nearly all in boys between the ages of 4 and 8 years), and here the contrast to Frölich's adipose-genital syndrome due to hypopituitarism will be obvious, just as virilism as a whole forms a contrast to feminism and infantilism. In very rare instances virilism has been described with ovarian cysts (Apert 4 cases) and solid tumours (Pozzi 4 cases), but Professor Glynn points out that investigation of the adrenals in these exceptional cases appears to have been neglected. His contention that virilism is not associated with lutein tumours of the ovaries or with the so-called "ovarian hypernephromas," which he considers are large lutein tumours, is instructive, because it might have been expected that, as the suprarenal cortex and the ovary are embryologically so closely related, their hormonic effects might also be much alike.

"Partial virilism" is the term applied by Achard and Thiers to bearded and moustached women who may be otherwise feminine, as is mentioned in Mr. Hastings Gilford's storehouse of information on *The Disorders of Post-natal Growth and Development* (1911); in such cases there is a dermal, and not a combined dermal and sexual, abnormality; the fronto-parietal thinning of the hair, so familiar in men, and obesity may also be found. Partial hairy virilism, indeed, passes gradually into the simple hypertrichosis so common after the menopause; and in later life some hyperplasia of the adrenal cortex is so comparatively frequent, especially in association with arterio-sclerosis, that its significance in partial hairy virilism is doubtful; the etiology of these cases is open to discussion, and an appeal to some pluriglandular disturbance is natural. Achard and Thiers describe a group of eight cases of women with partial hairy virilism and sugar intolerance in varying degrees. Their own case was a masculine-looking woman who had to shave from the age of 10 years; she had had one child, and menstruated until she was 60. At the age of 69 years she was found to have intermittent glycosuria and a systolic blood pressure of 220 mm. mercury. The necropsy showed uterine fibroids, large adrenals with hyperplasia, chronic thyroiditis with excess of colloid, slight portal cirrhosis of the liver, and pericanalicular fibrosis of the pancreas. The hirsuties and glycosuria were regarded as manifestations of a pluriglandular syndrome. Although some instances of hereditary hirsuties are quoted in the course of their paper, the authors insist that hirsuties is not a normal but a morbid process, and that the view of Brandt and Hofbauer, to the effect that it is a phenomenon of normal evolution and that bearded women are the pioneers of a future when women will be in all respects the equals of men, is fanciful.

CARBON MONOXIDE IN LIGHTING GAS.

OUR article of September 10th on the report of the Departmental Committee on Carbon Monoxide in Lighting Gas has evoked somewhat excited comments from a periodical devoted to the interests of the coal-gas industry. These comments are doubtless representative of ideas which are widely prevalent among gas engineers, and this convinces us of the desirability of making known what have been the actual consequences of a large increase in the percentage of carbon monoxide in lighting gas.

The Water-Gas Committee which reported in 1898 was appointed in consequence of the alarm produced by the casualties which followed the distribution of undiluted carburetted water-gas in one of the suburbs of Liverpool during a year or more. Since then the experiment has never been repeated in this country. As may be seen from the official returns of the Board of Trade, gas engineers have kept within the limits suggested by the Committee, so that no legal restrictions have been needed. But for the surprising, and in our opinion misleading, character of the new Committee's report there would be no reason to re-open the old discussion.

The conclusions of the 1898 Committee were based largely on the number of fatal cases of poisoning which had followed the unrestricted distribution of carburetted water-gas in the United States. Even from the very meagre information contained in the new Committee's report it appears that the number of casualties in the United States is as great as, or greater than, it was twenty years ago. So far from the conclusions of the old Committee being obsolete in view of more recent experience, as the *Gas Journal* has the hardihood to assert, more recent experience has borne out in every respect the conclusions of the old Committee. With the quite moderate increase in the carbon monoxide in lighting gas during recent years there has been a very marked increase in the cases of poisoning.

Shortly before the war the casualties due to poisoning by lighting gas in America were traced by Professor W. T. Sedgwick, Director of the Sanitary Research Laboratory of the Massachusetts Institute of Technology. He showed in the clearest manner, from the official statistics of over twenty years, that the enormous increase in the death rate from gas poisoning was due, not to the increasing use of gas itself, but almost entirely to the increasing use of carburetted water-gas. For the States of Massachusetts and Rhode Island, where official statistics were available, the death rate from gas poisoning had become almost equal to that from measles or scarlet fever. In Rhode Island it had risen to 7 per 100,000 of the population.

To those who imagine that further experience has shown that the opposition on the part of the medical profession to unlimited increase in the percentage of carbon monoxide in lighting gas is not justified by experience, we commend a perusal of Professor Sedgwick's article, which appeared in Volume viii of the *Journal of Infectious Diseases*.

THE HEALTH WORK OF THE LEAGUE OF NATIONS.

As has been reported in our columns from time to time, and as was fully explained by Dr. G. Buchanan in the address on international organization and public health, published on March 5th last (p. 331), the Assembly of the League of Nations decided last December to set up an International Health Organization to advise it on matters affecting health, to bring administrative health authorities in different countries into closer relation with each other, to organize the rapid interchange of official information, and to facilitate the institution or revision of international agreements for administrative action in matters of health. It was arranged that the organization should co-operate with the International Labour Organization in matters affecting the protection of the worker against sickness, disease and injury, and also that it should co-operate with international Red Cross Societies and other voluntary organizations under Article 25 of the Covenant. The League of Nations was not able to proceed with the scheme exactly on the lines adopted last December, chiefly by reason of the objections of the United States, but it is endeavouring as an interim measure to get the same results by a somewhat different machinery. Meetings have been held recently in Geneva, and on September 23rd the Assembly adopted a series of resolutions to govern the provisional health committee until such time as it can be placed on an officially permanent basis. The full text is practically identical with that given by Dr. Buchanan in the address referred to, and comprises all the objects mentioned above. It has been decided that the secretariat of the Health Organization of the League shall be appointed by the Secretary-General, that it shall be responsible to him, and shall be placed under the Medical Director; Dr. L. Rajchman has recently been appointed to this office. The Assembly of the League retains the power of regulating the constitution of important standing committees of the League, and, in view of the increasing importance of questions of health which more especially concern women, has invited the council to take into consideration the question of strengthening the committee by including a medical woman experienced in public health matters. The Epidemic Commission of the League of Nations already established forms one section of the health organization; it has already achieved results of great value in preventing the spread of typhus fever and other epidemic diseases from Russia to Western Europe. All the information available regarding the epidemic situation in Russia at the present time shows that it is very necessary fully to maintain measures already in force and to extend them to border states other than Poland. The grave risk of the spread of cholera from the parts of Russia now affected by famine is recognized, and it is proposed that representatives of the Commission should pay a short visit to Russia in order to obtain all the first-hand information and evidence that it is possible to secure. It has been decided to organize at once a general service of epidemiological intelligence and public health statistics and to consider the best way of disseminating such information. In a recent article on dangerous drugs and the Opium Convention it was mentioned that at a meeting of the Council of the League in June it had been decided to ascertain approximately what are the amounts of opium, morphine, cocaine, and other drugs enumerated in the Convention, required for legitimate purposes in various countries; the provisional Health Committee has appointed a special subcommittee to make such inquiries with regard to medicinal opium, morphine, and cocaine. It will be seen that the duties which the International Health Committee has so far undertaken all fall well within the scope of such an organization, and could, indeed, only be carried out by an international body enjoying diplomatic recognition. Dr. Buchanan, in his address, deprecated any suggestion that the League of Nations should make any revolutionary change in public health methods or attempt to replace the ordinary international medical conferences and congresses, or become a great centre for research. We agree with him that its real function is much more limited and special—namely, to promote international agreements and understandings between countries in respect of cases where something like official standards are necessary. The Office International d'Hygiène Publique in Paris has during the last ten or twelve years attempted to attain these ends with some success, but the work will be carried on with greater authority by the new organization, which will have the aid and prestige of the League and its financial support. The latter is at present limited to 400,000 gold francs—that is to say, about £20,000 as a maximum for the year. The arrangements which we have here outlined were unanimously adopted by the Assembly of the League on September 23rd, and the new (provisional) Health Committee was instructed to carry out the programme with the help of the Medical Director as completely as possible. The result of the practical working of the new organization will be watched with interest, but there seems good ground to hope that the International Health Organization of the League will become an important body working within the sphere now assigned to it.

RELATION BETWEEN MEDICAL AND VETERINARY SCIENCE.

IT appears as if the voice of Sir Clifford Allbutt crying in the wilderness for over thirty years the cause of comparative medicine had at last fallen upon ears not wholly unreceptive, for at the recent quarterly meeting of the Mid-West and South Wales Veterinary Medical Association at Bridgwater discussion ranged chiefly around this fascinating subject. Dr. W. G. Savage, who opened a discussion on bacterial food poisons, said that the tendency of the medical and veterinary professions to do their work in water-tight compartments was a source of weakness. He illustrated his contention by a short account of bacterial food poisoning in man so far as it concerned diseases in animals, and showed that they were still for the most part in the stage of hypothesis as regards the exact channels of infection. He had arranged to undertake a comprehensive investigation for the Medical Research Council, and asked for the co-operation of the veterinary profession in that research. Sir Layton Blenkinsop said that Dr. Savage's request was the manifestation of a spirit for which the veterinary profession had long been waiting, and he considered that closer co-operation between the veterinary and medical professions might help to elucidate many of the cases which now appeared obscure. Professor Hobday remarked that examples of well worked out systems whereby medical men and veterinary surgeons worked side by side in the laboratories and in the field were to be found on the Continent. After a discussion, which was animated and interesting, a resolution was unanimously adopted declaring that the time had arrived when practical means should be sought to ensure a closer co-operation of the two professions in matters of common importance. In a letter from Sir Clifford Allbutt which the President, Mr. W. M. Scott, F.R.C.V.S., read to the meeting, it was pointed out that it was impossible to fuse

veterinary with medical practice. Each had to have its own portal and examinations and qualifications, but, scientifically, provision should be made for a comparative study of disease in all life. What Sir Clifford hoped to see established in Cambridge, as he stated at the Annual Meeting of the British Medical Association in 1920, was not a clinical school of veterinary medicine, but a school of research in animal and plant pathology, in addition to the provision of education in the preliminary sciences which served both professions alike. The vast possibilities that lie in the undiscovered country of comparative medicine make this an ideal worth working for and worth living for.

VITAMINS IN SUN-DRIED VEGETABLES.

The current number of the *Biochemical Journal* contains a paper by J. A. Shorten and C. B. Ray, from the Physiological Laboratory of the Calcutta Medical College, on the antiscorbutic and antiberi-beri properties of certain dried vegetables.[1] The work was in continuation of an investigation undertaken at the request of Sir Leonard Rogers. The feeding experiments were made with sun-dried carrots, brinjal (egg-plant fruit), spinach, cabbage, tomatoes, potatoes, turnips, and turnip-tops, from 3 to 6 months old, and with mixed factory-dried vegetables of uncertain age. The sun-dried vegetables were prepared at the Government Fruit Experiment Station, Quetta; the mixed products came from Australia. For determining the antiscorbutic properties guinea-pigs were used; for the antineuritic properties, common fowls. The authors found that sun-dried tomatoes, potatoes, and cabbages retain to a considerable extent the antiscorbutic properties of the fresh vegetable; that sun-dried carrots, brinjal, spinach, turnips, and turnip-tops, have little or no antiscorbutic properties; and that most factory-dried vegetables are wholly devoid of such properties. Further, since cooking before consumption diminishes any antiscorbutic vitamin which may be present, these dried products should, when possible, be given in the form of salads. There was no evidence of neuritis in the fowls fed on sun-dried vegetables. In each set of experiments the animals were given, in addition to the ration of dried vegetable, an appropriate basal diet. Thus the scurvy-producing basal diet of the guinea-pigs consisted of crushed oats, bran and hay, with autoclaved whole milk and unrestricted water; the neuritis-producing basal diet of the birds was Rangoon polished rice with unrestricted water.

THE ANTIMALARIAL CAMPAIGN IN ITALY.

In a recently issued report[2] Grassi and Sella describe a highly successful attack on malaria as it existed in Fiumicino, a small district near Rome containing about 700 people. Whilst much of the report is so technical that it will only appeal to the specialist, there is a good deal that is of general interest. In the first part Grassi describes the course of the malarial infection as it occurred in Fiumicino, and dwells on the epidemiology and polymorphism of the malarial parasite. More than once he insists on the necessity for careful scientific work in dealing with the disease; just as much strict attention to detail is necessary as is required in a laboratory experiment, and the failure to stamp out an epidemic is often due to this want of scientific detail. The interesting condition of anophelism without malaria, he thinks, may be partly explained by the precarious vitality of the anopheles, especially during the hot months; this also may help to explain the limited character of epidemics brought by returned soldiers. Some experiments by Sella on the ovification also point in the same direction. As to polymorphism, the authors are inclined to accept this, rather than different species for the different types of malaria, thus in a certain sense going back to Laveran's ideas, but from a different standpoint. In all attempts at stamping out malaria one must take it as an axiom that the disease is only spread by means of the anopheles, which are infected only by biting malarial men, so that the main things to concentrate on are the destruction of the insect in all its stages and the curing of the man. In the second part of this report Sella deals largely with the practical methods employed at Fiumicino. After trying many larvicides he found that petrolization is the most effective and economical, cyanide coming in second; destruction by fishes cannot be relied on. In the case of the winged insect, smoke bombs, hydrocyanic fumes, liquid sprays, traps, hand capture, were all effective, and several photographs of the apparatus used are given; irrigation and drainage schemes are not sufficient alone; deforestation seemed of small value. A full and detailed account is given of *Anopheles claviger* and various biological problems in relation to it are discussed; its hibernation, deposition of ova, movements of the winged insect, distances at which it can act, points of difference between it and the Culex, etc. A bibliography of about 100 references is appended. The report as a whole demonstrates very clearly the careful scientific work that was done, and explains why the success was so marked.

ICE CREAM AND THE PUBLIC HEALTH.

Ice cream is much more popular in the United States than in this country, and the prohibition of alcoholic drinks is likely to increase its consumption. In New Jersey alone, according to the annual report of the State Department of Health for 1920,[3] the quantity of ice cream made in 1919 exceeded six million gallons, and this was 2,287,000 more than in the previous year. As the milk required for this output in 1919 was more than eight million gallons, the importance of proper sanitary control in the production of ice cream is obvious. The investigation of the conditions under which ice cream was manufactured and sold in New Jersey began in December, 1918. There were in this State 475 ice cream factories at work at the end of the year 1919, and each of these establishments was inspected at least once and usually several times for the purpose of seeing that the orders of the Health Department regarding faulty methods or inadequate equipment were complied with. A number of applicants for new places were rejected because there was too much risk involved in exposing the milk products to the air and dirt entering these places from the street through cellar doors and windows. About half the factories were below ground, but only those basements which were large and properly ventilated were approved for use by the Department. One of the defects found in the management of many of these factories was in the cleansing methods employed, and systems of running hot water have now been insisted upon. The milk products handled by the ice-cream manufacturers appear, says the report, to be of good quality, and in most cases they are properly looked after during manufacture. For some time past the Health Department has tried to persuade manufacturers to use nothing but pasteurized materials, and, while in 1918 only 37 showed a knowledge of that term, during the next year 195 of them employed pasteurized milk products. The most popular formula used in New Jersey for ice cream is a mixture of about equal parts of 20 per cent. cream, whole milk, and condensed skimmed milk, about 14 per cent. sugar, and one half per cent. gelatine. The quantities of these ingredients vary according to the ideas of the manufacturers. A few dealers purchased a mixture already prepared for freezing by the milk dealers from whom they obtained their supplies; this, so far as could be ascertained, was composed of milk, condensed milk, and sugar. Since there is no legal standard in New Jersey for ice cream other than that the ingredients should be pure and whole-

[1] *Biochemical Journal*, 1921, vol. xv, No. 2.
[2] Secondo Relasione della Lotta Antimalaria a Fiumicino, diretta dal Professore B. Grassi. Rome, 1920.
[3] *Forty-third Annual Report of the Department of Health of the State of New Jersey, 1920.* Report of G. W. McGuire, Special Agent in Charge of Ice Cream Factory Inspection.

some, there is a danger that foreign substances, especially fats, may be used by some manufacturers for the purpose of cheapening the product, and it is considered by the health authorities that the time has arrived for the enactment of a State law defining ice cream. A bill was introduced in the Legislature at its last session, which, however, as it stood permitted the use of fats, other than butter fats, in ice cream. It was pointed out to the introducer of the measure that butter fat contained substances necessary to the growth of the human body which were almost wholly absent in the case of many other commercial fats, so that the substitution of other fats for butter fats would have a distinctly injurious effect upon the nutritious properties of ice cream. The bill was finally withdrawn, and it was proposed to hold a conference of health officials with representative ice cream makers to consider the subject. It is to be hoped that the health officials have managed to persuade the manufacturers that what is best for the health of the community may also be best for themselves in the long run.

SIR ERNEST CASSEL'S GIFTS.

IN addition to a number of large gifts to King Edward's Hospital Fund for London, and during the war to the British Red Cross and Order of St. John, the late Sir Ernest Cassel will long be remembered by the medical profession for the large share he took in the establishment of the London Radium Institute, and his munificence in founding and endowing the King Edward VII Sanatorium for Tuberculosis at Midhurst, and the Hospital for Functional Nervous Disorders lately opened at Penshurst. The former institution had its origin in the wish of King Edward to establish an institution in England on the lines of that at Falkenstein, which His Majesty had visited and admired. The sum of £200,000, which Sir Ernest placed at the disposal of the King for any philanthropic purpose, made possible the realization of that wish, and the opening ceremony took place in June, 1906. This year he gave £225,000 to found and endow the Cassel Hospital at Swaylands, Penshurst, which is primarily intended for members of the educated classes unable to meet the heavy expenses of care and treatment in a nursing home. The Papworth Industrial Colony for Consumptives, visited by many members of the British Medical Association during the Annual Meeting at Cambridge, was also founded by Sir Ernest Cassel as a complementary institution to that at Midhurst.

MEDICINE IN BAGHDAD.

THERE appears to be a very living interest in medical affairs in Baghdad, fostered by the exertions of the Baghdad Medical Society founded in August, 1920. It has recently published its annual report, from which it appears that it has had a busy year. It has a membership at present of fifty, of whom twenty-three are British, while the attendance on several occasions has been so good that every local member was present. Most of the meetings held during the past year were clinical, but some were occupied with the discussion of important local matters relating to public health and to medico-political affairs. In regard to the campaign against venereal diseases and the control of prostitutes in Baghdad, the society made some public-spirited recommendations which cannot have failed to exert a considerable influence with the authorities. The question of medical practice by unqualified persons in Baghdad was also considered fully at two meetings of the society, with the result that it was recommended that no persons—with the exception of two well known and experienced practitioners of recognized standing—should be allowed to practise in Irak who did not hold the diploma of a recognized medical school, and that the existing hakims, dressers, and herbalists should be registered and their work restricted and supervised. The question of medical education in Irak also came under consideration and was discussed at two meetings of the society. It was considered that the provision of medical education on the spot was an urgent public health necessity, and that the best means of meeting this end was to found a medical college at Baghdad. Adequate hospitals exist for the teaching required, but buildings for a medical school are necessary, and the society urged the Government to consider this matter as one of the most essential branches of education necessary for the development and prosperity of the country. As high officials in the medical services seem to be represented in the membership of the society, together with British and Mohammedan medical practitioners, these recommendations may be accepted as the considered opinions of the medical profession in Mesopotamia, and it is to be hoped that the Government will realize the importance of the questions raised and the value of the representations which have been made to it. Since the date of publication of this annual report we learn that the Baghdad Medical Society has converted itself into the Baghdad Division of the Mesopotamia Branch of the British Medical Association, and there is every prospect that the society will be even more successful and prosperous in the future.

"MEDICAL REGISTER": CHANGE OF ADDRESS.

ON several occasions we have drawn the attention of medical practitioners to the necessity in their own interests of informing the General Medical Council of any change of permanent address. Failure to do this may lead to erasure of the name from the *Medical Register*, and the practitioner will be put to the trouble of getting it restored and be required to pay a fee of £1. The trouble and expense of so doing may easily be avoided by prompt notification to the Registrar. More than a year ago we published at the request of the Council a list of practitioners who could not be traced. We now print in this week's SUPPLEMENT (p. 128) the names of those medical men and women who have not responded to the inquiries recently made by the Registrar. Any of those who find their names in this list should immediately communicate with the Registrar of the General Medical Council, 44, Hallam Street, Portland Place, London, W.1. Information from friends of deceased persons or others will also be welcomed. The publication of these lists at the request of the Council is a special measure only decided upon in view of the exceptional circumstances arising out of war conditions, and the subsequent redistribution of many members of the medical profession.

WE regret to announce the death of Dr. Albert S. F. Leyton, of Cambridge, late Professor of Pathology in the University of Leeds. We hope to publish an obituary notice in an early issue.

THE SUPPLEMENT this week contains a communication from the Secretary of the Ministry of Health indicating the Minister's intention to reduce the insurance capitation fee at the end of this year. An address on the question whether the medical profession wishes the National Health Insurance system to continue, given by Dr. Cox to the Birmingham Branch of the Association on September 30th, will be published in our next issue. The Annual Report to be presented by the Insurance Acts Committee to the Panel Conference on October 20th is printed in this week's SUPPLEMENT.

MR. C. J. BOND, C.M.G., F.R.C.S., and Professor William Bulloch, M.D., LL.D., F.R.S., have retired from the Medical Research Council in accordance with the provisions for rotation made in the Royal Charter under which the Council is incorporated. The Committee of Privy Council for Medical Research, after statutory consultation with the Medical Research Council and with the President of the Royal Society, has appointed Sir Frederick W. Andrewes, M.D., F.R.S., and Sir Cuthbert Wallace, K.C.M.G., C.B., F.R.C.S., to fill the vacancies so caused. The new appointments date from October 1st, 1921.

Correspondence.

TREATMENT OF EMPYEMA.

Sir,—I have been much interested in the discussion at the recent meeting of the British Medical Association on the treatment of pleural empyema, and take this opportunity of bringing to your notice a method that I have carried out for several years with, I think, considerable benefit to my patients.

The points I aim at are: (1) Complete evacuation of the pus and fibrinous masses; (2) avoidance of a sucking wound; (3) adequate drainage; (4) early re-expansion of the collapsed lung.

After a fairly wide thoracotomy, 3 in. or more of the rib at the most dependent point of the empyema being removed, the abscess is evacuated, all fibrinous masses and débris being removed by the fingers and forceps. A large rubber tube is then introduced just within the pleural cavity, and the muscles and pleura stitched firmly around it. The skin incision is closed and the tube retained in position by two silkworm gut sutures, transfixing it and both the skin and deeper tissues. The tube is then clamped and the patient returned to bed.

On recovering from the anaesthetic the patient is propped up, and an additional rubber tube filled with boric acid solution connected to the drain by means of a glass tube. The second tube having been looped to form a trap, is led into a receptacle containing boric acid solution at the bedside.

The practice of blowing fluid from one bottle to another is carried out from the second day, or when the patient is well enough, in order to facilitate expansion of the damaged lung. The patient is also kept outside in the open air all day.

As soon as the discharge becomes serous in character, usually about the sixth or seventh day, the tubes are removed, and a piece of thin rubber or gutta-percha tissue fixed over the wound. This prevents air entering the wound should a cavity still persist, while allowing drainage to continue.

In all my cases the wound was soundly healed in twenty-one to twenty-eight days. An additional advantage is the practical absence of dressings during the first week.

Although my results have been very satisfactory, I realize that the number of my cases (ten) is small; that all the cases were operated on early, and that with one exception were due to a pneumococcal infection. Whether this method will continue to give equally successful results in the future I will be interested to see.—I am, etc.,

Geo. McMullan, M.D., F.R.C.S.E.

Wallingford, Sept. 20th.

HAEMORRHAGE IN TONSIL OPERATIONS.

Sir,—In the interesting articles in your issue of September 17th stress is laid upon treating haemorrhage after tonsil operations on recognized surgical principles. Yet your contributors ignore one of the oldest canons of surgical practice. Haemorrhage in tonsillectomy is overwhelmingly venous. Doubtless arterial twigs are severed, but the bright arterial blood is buried in the stream from the veins, whilst the dark flood which pours out when the dependent head hangs over the table for the ablation of adenoids demonstrates the venous character of the bleeding. Though every ambulance neophyte knows that venous bleeding can be controlled by raising the bleeding point, your contributors insist that after tonsillectomy the patient should be laid flat.

During more than forty years' practice I have removed some thousands of tonsils in private as well as hospital practice, and neither in adults nor children have I had to adopt any of the special measures described in such detail by your contributors, and have never administered calcium salts or any other preliminary haemostatic. As soon after the operation as the patient responds to pinching of the skin I put him or her reclining against the sloping end of a couch with the head high. This empties the veins of the neck and depletes the cut veins. To empty veins is to lessen tension in adjacent arteries, which are able to contract, whilst the slowing of the blood current allows the safety clot to form and seal their ends.

It may be asked, Is there no danger of syncope in searing up a semi-conscious patient? In theory there may be, in practice there is none. For in a short time the cut area just oozes, and the only sign of bleeding is the expectoration of blood-stained mucus. To keep the patient flat, with the head level with the body, is to keep the field of operation engorged with blood and favour haemorrhage, which, as it continues, excites coughing, with the dislodgement of clots and the reopening of vessels.

I always use Mathieu's French guillotine, with which and a pair of vulsella the tonsils can be removed as thoroughly as with Mackenzie's guillotine. I have given the anaesthetic some hundreds of times for operators who use Mackenzie's instrument, and have more than once seen life endangered by after-haemorrhage, as well as an unduly large proportion of cases where the continuance or recrudescence of haemorrhage caused anxiety. I ought to add that in all these cases the patients had lain flat. This experience has led me to conclude that after the use of Mathieu's model, with a blade neither sharp nor blunt, the risk of after-haemorrhage is less than when the Mackenzie instrument is used.—I am, etc.,

Pwllheli, North Wales, Sept. 22nd. Norman Porritt.

OPERATION FOR APPENDICITIS.

Sir,—The paper on the best method of operative approach in cases of acute appendicitis, and the subsequent discussion, reported in the Journal of September 10th, reveals a curious disregard for a point which I consider to be second only in importance to removal of the appendix.

In Sir Hamilton Ballance's paper, and in the discussion, are frequent references to drainage and drainage tubes. In some cases it is evident these are intended to protrude into the abdomen; nowhere is it urged that the abdominal cavity should be closed. Yet the manner of closing the abdomen is, I think, of far more concern than the method of opening it.

If the appendix is removed, and any collections of pus carefully wiped away, it is only on rare occasions that the peritoneum may not be completely sutured. It is not the peritoneal cavity that suppurates after operation, but the infected wound of the abdominal wall, and the less injury done to the tissues in making that wound so much the less suppuration will there be. This should be our chief guide in selecting the best method of operative approach in cases of acute appendicitis.

No one who has experienced the freedom from post-operative complications of cases treated without intra-abdominal drainage would willingly return to this crude device. Until one can secure the parietal wound against infection it must be drained, preferably by a strip of thin rubber, but always our aim should be to reduce that infection to a minimum.—I am, etc.,

Hull, Sept. 20th. Harold Upcott.

RHEUMATISM AND BACON.

Sir,—One of the commonest complaints is muscular rheumatism in one or other of its protean forms, "lumbago," "myalgia," "neuritis," or other variety of pain situated in the musculo-ligamentous tissues; the attacks vary considerably in their intensity, frequency, and duration in different individuals, and in the same patient at different times.

There is a growing tendency to associate rheumatism of every variety, acute as well as chronic, with a carious condition of the teeth, and especially so if the caries is associated with pyorrhoea alveolaris: it is thought that the dental disease is one and perhaps the only etiological factor in the rheumatic condition. Certain it is that the two conditions—rheumatism and pyorrhoea—are frequently present in the same patient; so frequently, in fact, that one seems justified in regarding the rheumatism not only as a sequela, but an actual result of the pyorrhoea in certain cases. But pyorrhoea is certainly not invariably followed by rheumatism, for I have observed extensive disease of the teeth and gums in patients who have never complained of rheumatism.

For the last sixteen or seventeen years I have paid rather special attention to the diet of my rheumatic patients, and have been impressed by the fact that there is one article of food of which they all partake, and which I have been compelled to regard as more or less directly associated with their attacks of rheumatism. The article to which I refer is bacon. I have come to the following conclusions:

1. Bacon excites an attack of rheumatism, even if it does not actually cause it.
2. Sodium salicylate frequently fails to give relief whilst bacon is included in the patient's diet.
3. By omitting bacon a more rapid recovery takes place.
4. Rheumatic patients remain practically free from their pains if bacon is discontinued.
5. Therefore bacon is unsuitable for rheumatic people; in fact, it may be called a poison to rheumatic people.

During the time referred to above I have attended hundreds of cases of muscular rheumatism, and in every case the patient was a bacon eater. One patient had rheumatism of the muscular and nervous type for years, and derived no relief from the advice and prescriptions of several eminent physicians, but was free from pain within a few days of cutting bacon out of his diet. So intimate is the connexion between bacon and rheumatism that when a patient comes to me complaining of this malady, I no longer ask "Do you eat bacon for breakfast?" I say to him, "You must leave off your breakfast bacon," or "You must not eat bacon."

Bacon is an exceedingly common and popular article of diet, and perhaps the majority of people eat it. Still, there are many who never touch either bacon or ham or other salted meat, and careful inquiry will show that these people seldom if ever complain of rheumatic pains.

I do not know why bacon should have the effect referred to: it is probably not due to the salt it contains, for many non-rheumatic people take salt very freely. It is more likely due to some change in the protein or other organic constituents caused by the curing. Bacon is certainly not a natural food, however much it may appeal to the palate.

It must not be inferred from the foregoing remarks that I mean to imply that all bacon-eaters suffer from rheumatism, for such statement would be incorrect. There are people who eat bacon and are also free from rheumatism. The thesis I advance, and to which I hope the attention of other observers will be directed with a view to confirmation or otherwise, is:

1. Some people eat bacon as a regular article of diet without developing rheumatism in any form.
2. Rheumatic people (muscular type) are always bacon eaters, and for them bacon may be described as a poison.
3. Such sufferers must leave off their bacon if they are to be permanently relieved of their pains.
4. Medicinal treatment must be associated with suitable dietetic treatment.

My text which I conclude with is: People who suffer from rheumatic pains should never eat bacon.—I am, etc.,

Wrexham. H. DRINKWATER, M.D.

*** The possibility of the existence of some relation between bacon and arthritis did not escape the attention of Montaigne. He wrote (Florio's translation: Dent's edition, Book I, chapter iv): "A gentleman of ours exceedingly subject to the gowt, being instantly solicited by his Physitions, to leave all manner of salt meats, was wont to answer pleasantly, that when the fits or pangs of the disease tooke him, hee would have some body to quarell with; and that crying and cursing, now against *Bolonie*-sausege, and sometimes by railing against salt neats-tongues, and gammons of bakon, he found some ease."

THE "ACUTE ABDOMEN."

SIR,—Whilst thanking your reviewer for his fair—nay, his generous—review of my book, *The Early Diagnosis of the Acute Abdomen*, will you allow me to defend the title against the charge of being "slangy"? The term "acute abdomen" was chosen with forethought, and, though no purist, I would not willingly let judgement on the charge go by default.

Slang is rather difficult to define, but is commonly regarded as any phrase or words needlessly vulgar or inelegant. Slang terms of one period are frequently acceptable terms of a later time. During the transition it must frequently happen that opinions differ as to the correctness of any such expression. I consider "acute abdomen" to be in the transition period, and I advisedly use it to designate what I consider no other short title expresses.

The "acute abdomen" is generally understood amongst the profession to signify that abdominal condition which arises suddenly as the result of disease or injury, and needs, or appears to need, surgical interference. Some might suggest "acute abdominal disease" or "acute abdominal crisis" as alternatives. Against the former it may be urged that it includes many diseases not usually classed in the recognized category of the acute abdomen—for example, acute dysentery, cholera, uncomplicated acute nephritis, acute yellow atrophy of the liver, acute Addison's disease. The term "acute abdominal crisis" would fit the case better, but to a certain extent it is open to the same objection as that given against "acute abdominal disease," it is certainly not in very common use, and the term "crisis" has, in relation to the abdomen, been rather restricted to the manifestations of tabes dorsalis.

The term "acute abdomen" is more definitive and certainly no more inelegant than many terms allowed currency by all members of the profession, for example, locomotor ataxy. Some years ago Mr. Battle boldly made a bid for its adoption by the profession when he included it in the title of one of his books. But it is difficult to get the hierarchy of the profession to countenance new terminology. Since then the term has continued to be sanctioned by use and utility; but for its attainment of a recognized place in the official currency of the language it is essential that the medical journals of light and leading must bless it, adopt it, and pass it into that currency.—I am, etc.,

London, W., Sept. 25th. ZACHARY COPE.

PIGMENTATION AND LESIONS OF THE SUPRARENAL GLAND.

SIR,—I would like to make use of the hospitality of your columns to inquire whether there is any known relation between lesions of the suprarenal gland and the appearance of melanoblast cells in the haemolymph glands? In certain inoculation experiments recently carried out with various preparations of suprarenal extracts, such cells were found constantly when using extracts that contained adrenaline, and in no other cases; the cells were distributed *via* the lymph channels. Is it possible that the pathological appearance of such cells in pigmented tumours is in any way connected with hyperactivity of the suprarenals? I should be most grateful for information bearing on this point, or for any references that I could look up.—I am, etc.,

London (R.F.H.) School of Medicine for Women, W.C.1, September 24th. EVELYN E. HEWER, M.Sc.

VON PIRQUET'S TEST.

SIR,—In the JOURNAL of September 17th, 1921 (p. 468) Dr. T. Gerald Garry, M.B.E. (Cairo), writes:

"In the account of the International Tuberculosis Conference, appearing in the JOURNAL, Dr. Wilkinson is reported as having said the von Pirquet test is unreliable, while Sir Humphry Rolleston counselled as not Utopian a periodic census of all persons, classifying them by means of von Pirquet's test and segregating them accordingly, either temporarily or permanently."

I meant what I said, and my statement is easily capable of proof. Sir Humphry Rolleston could not have meant what he said; and that also is easy to prove. He may have been joking; certainly he was dreaming. He can have made no observations to justify such an expression of opinion.—I am, etc.,

W. CAMAC WILKINSON, M.D. Lond., F.R.C.P.

London, W., Sept. 24th.

THE FORMOL-GEL REACTION IN SYPHILIS.

SIR,—May I be allowed to put a further nail in the coffin of this ridiculous test?

Prior to my recent holiday, with the assistance of my Senior Laboratory Assistant (Mr. F. R. Chopping) I tested a series of some 25 bloods, comparing the results with the Wassermann test (performed by Method IV of the Medical Research Council). My findings were much the same as those of Mr. Murray Stuart (BRITISH MEDICAL JOURNAL, August 13th) and Professor Beattie and Dr. F. C. Lewis (September 10th).

In addition, thinking that the English formalin might have some different reaction to the Continental formalin, we did another series, using some pre-war German formalin (Schering). The results were just as useless as in the first series, and not only this: we came to the conclusion that the same serum would give a different degree of viscosity on different days of testing it.—I am, etc.,

JOHN A. BRAXTON HICKS, M.D., D.P.H., M.R.C.P.,

London, Sept. 20th. Pathologist, Westminster Hospital.

EXPERIMENTAL RICKETS.

SIR,—In your editorial article on experimental rickets in the JOURNAL of September 17th there is surely an error. You mention that the substitution of 0.4 per cent. secondary *calcium* phosphate (K_2HPO_4) for 1/7 part calcium lactate prevented rickets on diet deficient in vitamin A. Should calcium read potassium, or K read Ca?

The matter is of interest to one from reading Dr. Porter's paper in the *Medical Record* of September 18th, 1920, on acidosis. The writer points out that a demineralization of the bones and teeth takes place when there is a shortage in the formation within the body of the disodic mono hydrogen phosphate (Na_2HPO_4), and shows how this shortage may be brought about. If in your editorial calcium is a misprint for potassium, the work of Sherman and Pappenheim would seem to support the view suggested by Porter, and may very possibly bear some relation not only to the etiology of rickets, but to that of dental caries also.—I am, etc.,

F. W. Broderick, M.R.C.S., L.R.C.P., L.D.S.

Bournemouth, Sept. 19th.

*** Dr. Broderick is right: calcium was written in error for potassium. We are obliged to him for his correction.

Obituary.

JOHN WARD COUSINS, M.D.Lond., F.R.C.S.Eng.,
Consulting Surgeon, Royal Portsmouth Hospital; late President of the British Medical Association.

We regret to announce that Dr. J. Ward Cousins, a former President of the British Medical Association, died on September 21st at his house in Southsea, at the advanced age of 87.

John Ward Cousins was a son of the Rev. Thomas Cousins of Portsmouth. He studied medicine at St. Thomas's Hospital, where he won the Cheselden Medal in 1856, the year in which he obtained the M.R.C.S. diploma and the licence of the Society of Apothecaries He graduated M.B. of the University of London in 1858, and proceeded M.D. in the following year. In 1860 he became a Fellow by examination of the Royal College of Surgeons of England. After holding resident appointments at St. Thomas's and at the Victoria Park Hospital, he returned to Portsmouth and soon devoted himself entirely to surgery. In 1860 he was appointed assistant surgeon to the Royal Portsmouth Hospital, and remained on the active staff for nearly half a century, retiring in 1908, when he was elected a consulting surgeon and also a vice-president. He was one of the founders of the Portsmouth and South Hants Eye and Ear Infirmary and specialized in ophthalmic surgery, in addition to practising as a general surgeon. Dr. Ward Cousins had great mechanical skill and inventiveness, and devised many inventions and improvements in surgical instruments. In recognition of this side of his work he was awarded a prize medal by the British Medical Association in 1884 and a gold medal at the International Inventions Exhibition. He was a member of the Council of the Royal College of Surgeons of England from 1895 to 1899, and represented the College on the Central Midwives Board.

Throughout his long professional life Dr. Ward Cousins was a most staunch and active supporter of the British Medical Association. He was honorary secretary of the Portsmouth Division for many years, and later president of the Division and of the Southern Branch. In the early eighties he was a member of the old Committee of Council, and from 1893 to 1895 president of the Central Council of the Association. On the occasion of the Annual Meeting in Portsmouth in 1899 he was President of the Association; a great measure of the success of that meeting was due to his unfailing tact and courtesy as well as to his generous hospitality. From 1900 to 1902 he was a member of the Constitution Committee of the Association, and he served on many other committees.

Dr. Ward Cousins married twice, and leaves a widow and one daughter.

Mr. Charles P. Childe, F.R.C.S., writes: I have been on terms of intimate acquaintance and friendship with the late John Ward Cousins, always known in Portsmouth as Dr. Ward Cousins, for over thirty years. At the advanced age of 87 he was laid to his last rest on September 24th amid the respect and sorrow of a large number of old colleagues and friends in the medical profession of Portsmouth, though he had outlived many of his contemporaries, and was scarcely known to the younger generation of practitioners. When I commenced practice here he was at the zenith of his powers, and to these he gave the fullest scope. It was a time when surgery was not so highly specialized as it is at the present day. In addition to being senior surgeon to the Royal Portsmouth Hospital, he was senior surgeon to the Eye and Ear Infirmary and to the Medical and Surgical Home for Women. In fact he was mainly instrumental in founding the Portsmouth and South Hants Eye and Ear Infirmary, which has risen from its small beginnings to be the splendid institution it now is. Amongst his colleagues at the various institutions he served he was most popular, and his advice and help were freely sought and as freely given. He was a member of the staff of the Royal Portsmouth Hospital for forty-eight years, and for many of these years he was the outstanding figure and the very backbone of that institution. If I were asked to state Dr. Ward Cousins's outstanding characteristic as a surgeon I should say it was his thoroughness—no time was too long, no trouble too great for him to spend over any case, no care too exacting in the performance of any operation. The number of hours he devoted to his hospital work was prodigious. In addition, he took an absorbing interest in the administration of the hospitals he was serving and in their welfare generally, and was a most regular and valued member of their committees. His heart was in his work, and his profession was his hobby. He made his annual holiday invariably coincide with the annual meetings of the British Medical Association, at which he was a regular attendant and a very familiar figure until quite recent years. He had an original mind, and was always interesting to listen to on any subject connected with the practice of surgery, or on any other subject for the matter of that, and his originality found an additional outlet in the many surgical instruments he invented or modified. He took part, too, in the civil life of Portsmouth, and was for many years an active magistrate. It will be seen that he had a very full life as well as a very long one, and he lived every day of it in the best way of all—devotion to duty. To come to his lighter and more human characteristics: he was of a most cheery and genial disposition, being full of good temper and of humour; he was never ruffled or put out, or, at least, he never showed it. I believe no figure has appeared in Portsmouth so much admired for his devotion to work or so generally popular amongst the medical profession as John Ward Cousins. *Requiescat in pace.*

Mr. Henry Rundle, F.R.C.S., writes: By the death of John Ward Cousins Portsmouth has lost a familiar figure, and one who was for many years its most widely known surgeon. He had reached the late evening of a long working day, lived a full life, had done his work, and done it well. A strong and vigorous personality, he was remarkable alike in his character and abilities. A most notable trait was his intense and maintained energy. Such was the enthusiasm which he threw into his work that he invariably succeeded in anything which he undertook. The Royal Portsmouth Hospital was an overshadowing influence, and filled a large place in his life. His work there will stand as his chief memorial. An able surgeon, his professional work was thorough and abreast of the times. He was always eager to hear of anything new in the field of surgery. He had a great capacity for taking pains, and his successful results were largely due to attention to details and to the constant personal care bestowed upon every case. He never spared himself, and counted no hours too many for his hospital duties. He took the greatest interest in the many changes and developments of the institution, and in the movement which led to the building of new wards. His relations with the staff were most cordial, and were influenced by a desire to foster a spirit of sympathy and *esprit de corps*, which knits hospital life together and prevents friction. He took a great interest in the younger members of the profession, and gave them much encouragement in their future career, for which many owe a debt of gratitude to him. He did not write much; his occasional contributions to the medical journals or to societies were pointed and practical. His connexion with the British Medical Association in various offices extended over many years. He was President of the Portsmouth Meeting held in 1899; many will remember the address which he delivered then without a note and without a falter, reeling off facts and dates with great facility. His cheery social qualities and generous hospitality contributed much to the success of the meeting. He took part in many and varied

works outside his profession. Fond of reading and study, he was the honorary secretary of a local literary and scientific society, of which he was the mainstay. Broad-minded to a degree, his charity led him to think the best of all men and made him most tolerant of the opinions of those who differed from him. Dr. Cousins leaves behind him the inspiration of a beneficent life well spent in doing good to his fellows, and to many the remembrance, which will long be treasured, of one of the kindliest of men and the truest of friends.

"C. H. W. P." writes: The death of my old friend Dr. Ward Cousins brings to my mind the memory of the debt the British Medical Association owes him for establishing the old Southern Counties Branch some fifty years ago. At that time there were only a few individual members scattered about the district, and the Journal was the only means of intercommunication. Dr. Cousins had much to contend against, and it was only by constant, untiring work and personal tact and influence that he was able to overcome the general apathy and start the new Branch, comprising all Dorset and a large portion of Hants, Wilts, and the Isle of Wight. He realized that so large an area could not be worked from Portsmouth alone, and travelled all round, forming the country into districts and appointing District Secretaries as follows: South and West Dorset, Dr. Lush (Weymouth); Southampton, Dr. Trend; Salisbury, Dr. Manning; Winchester, Dr. Langdon; Bournemouth, Dr. Nunn; East and North Dorset, myself; and Isle of Wight, Dr. Groves. Portsmouth remained under his own charge, and he was also General Branch Secretary. Each district held two or more meetings a year; an annual Branch meeting was held in the districts in regular order, and at it the various officers were appointed. The number of members increased rapidly; the meetings were well attended; papers were read and cases of interest shown, and the proceedings always wound up with a dinner and pleasant reunion and renewal of old friendships and formation of new ones. Cousins was always present at the Branch meetings and added greatly to the success by his genial company. I am the last survivor of the original District Secretaries, and I do not know any one remaining of those who founded the Branch.

C. P. COOMBS, M.D.Lond., J.P.,
Castle Cary, Somerset.

By the death of Dr. C. P. Coombs, on September 13th, the medical profession in the West of England loses a striking personality. He was born at Frome in 1842; he went to school in the same town, where at 14 he was apprenticed to his uncle, Dr. Joshua Parsons. Shortly after he went to the new medical school at St. Mary's Hospital, where he did very well, passing his first M.B. with honours in several subjects, and being appointed successively an assistant demonstrator of anatomy and house-surgeon. Under the influence of Gibson and Broadbent he became an enthusiastic student of medicine, and might have aspired to a position on the honorary staff but for the circumstances which made it necessary for him to join his uncle in practice; at this time (1865) he went to Beckington, near Frome, to take charge of a branch of the practice. In 1866 he married Mary Leslie, daughter of Mr. William Franklin of Coventry. In the following year he bought a small practice at Castle Cary, Somerset, where he worked till 1911, retiring then after a seven-years' partnership with Dr. David Price, who succeeded him. During these years he held various appointments, including those of medical officer to the Poor Law in the Wincanton and Shepton Mallet Districts.

He was for many years a member of the British Medical Association and a constant attendant at the meetings of the Bath and Bristol Branch, of which he was president in 1895–6. His presidential address on "Galvanism in the treatment of neuritis" he afterwards expanded and published in the form of a small book, thus following up an article on electro-therapeutics which he had contributed to Tanner's *Practice of Medicine* in the seventh edition, issued in 1875 by Sir W. H. Broadbent. He wrote a number of papers for the medical journals, and also contributed articles to *Chambers's Journal* and other lay periodicals. His interests had always been very wide and varied; wood-carving, painting, gardening, music, and archaeology all claimed his attention and furnished his busy mind with occupation. In 1911 he became a justice of the peace, and also chairman of the School Managers of Castle Cary. These and kindred interests went far to fill the gap left by the cessation of practice, and until his health began to fail in 1920 he pursued his public duties with the same energy that had characterized his professional work. He was a tall, handsome, ruddy man, with an expression of kindliness that corresponded exactly to his character. Both professionally and as a private citizen the motive force of his life was service. To everyone who knew him he was the perfect presentation of that great gentleman—the English country doctor. After a period of impaired health his life was ended by a brief and painless illness, in his 80th year. He is survived by his wife, three daughters (the eldest daughter died of cholera in 1914, in the service of the Baptist Zenana Missionary Society in India), and one son, a member of the medical profession.

GEORGE HUNTER, M.D., F.R.C.S., F.R.C.P.Edin.,
[Formerly of Linlithgow.

Although Dr. George Hunter, whose death at the age of 79 occurred on September 20th, had retired from active practice a good many years ago, he took a real interest in all medical matters in Edinburgh. He was born at Newfield in Dumfriesshire in 1842, was educated at Hutton Hall School in the same county and at the University of Edinburgh; he graduated as M.B. and C.M. with honours in 1867, and M.D. in 1869; he became F.R.C.S.Edin. in the following year and a Fellow of the sister College of Physicians in 1891. After some minor appointments he went, in 1869, to Linlithgow as assistant to a well-known country practitioner, the late Dr. George Dallas Baird. His keen love and devotion for his professional work, and his kindly interest in all his patients—rich and poor, without distinction, received the same careful attention—soon won for him a unique place in the county. When ill health compelled Dr. Baird to retire Dr. Hunter succeeded to the practice, which, in his able and active hands, was rapidly and widely extended. But twenty years of unremitting toil in a large country practice told on his hardy constitution, and he was compelled to retire for a time from active work.

In 1890 he removed to Edinburgh, where he resumed his student days, attending classes in physiology and pathology, and, though verging on 50, he was not above acting as demonstrator in the practical classes connected with these subjects. His true sphere, however, was at the bedside, and he soon acquired a large and influential city practice. He was highly respected by his colleagues and by the profession in Edinburgh, by whom he was known as one of the country doctors who kept abreast of all the latest advances in medical science. In the days when knowledge of the specialities was less general than now, Dr. Hunter was in advance of the times in demanding from the young men who came to him as assistants a good working acquaintance with diseases of the eye, the ear, and the throat.

Dr. Hunter became a Fellow of the Edinburgh Obstetrical Society in 1881, and acted for a time on the council of that body. He had held the office of President of the Scottish Microscopical Society, to the *Transactions* of which he communicated articles on the development of the liver and on its comparative histology. He also wrote an article in 1876 on "Puerperal fever and septicaemia, their relations and probable identity," for the *Edinburgh Medical Journal*, and another on "The place of specialism in general practice" for the same journal in 1885. Dr. Hunter was a J.P. for West Lothian. He had been examiner in physiology and public health in the Royal College of Surgeons, and for a time acted as Director of the Royal Hospital for Sick Children. When the war came he, though over 70 years of age, felt it his duty to act on the medical boards connected with recruiting and pensions, which work he did with his usual enthusiasm and conscientiousness. The strain, however, was too great, and he was compelled to relinquish active work and take life more leisurely, much to the regret of a large number of colleagues and patients. For the last three years his health had been gradually failing. He died at his house in Edinburgh, and the funeral was from St. George's Church, Charlotte Square, of which he was an elder.

H. C. MAJOR, M.D.,

Consulting Physician, Bradford Royal Infirmary.

WE regret to announce the death of Dr. Herbert Coddington Major, which occurred at Oxford after a short illness on September 13th. Born in Jersey, Dr. Major was educated at Victoria College there, and afterwards at Edinburgh University, where he graduated M.B., C.M. in 1871, and M.D. in 1875, receiving a gold medal for his thesis on "Histology of the brain in apes." After graduation he was appointed, in 1876, to the West Riding Asylum, Wakefield, and on the retirement of Dr. (now Sir James) Crichton-Browne he became medical superintendent, a position which he held until 1884; he was also appointed lecturer on mental diseases to the then Leeds School of Medicine (now Leeds University). After retiring from this post, Dr. Major became a consulting physician in Bradford, being elected an honorary physician to the Bradford Infirmary and to the Bradford Fever Hospital. He was at one time President of the Bradford Medico-Chirurgical Society, and in 1898 he was elected an honorary consulting physician to the Bradford Infirmary. Two years later he retired from active practice and went to reside at Bedford, where he accepted the post of honorary pathologist to the Bedford County Hospital, and where he was also, for two years, president of the Bedford Medical Society. He left Bedford in 1907 for his native Jersey, and lived there in retirement until this summer, when he removed to Oxford.

Since 1872 Dr. Major had been an active member of the British Medical Association, and he held office as president of the Yorkshire Branch in 1901, chairman of the Bedfordshire Division for two years, chairman of the Jersey Division for two years, and president of the Channel Islands Branch in 1919. He was the author of many contributions to medical literature, chiefly on histological subjects. He was a physician of the most charming disposition, of such a kindly nature that it is impossible to imagine that he ever made an enemy. He made his home, as has been noted, in several widely separated parts of the country, but wherever he went his colleagues realized his worth and insisted on placing him in positions where his abilities could be of the greatest use to his profession and to the community. Dr. Major is survived by his widow, but he had no family.

Dr. S. J. Ross (Bedford) writes: As a colleague Dr. Major's habitual courtesy, kindness, and sincerity endeared him to all. His pathological work was very thorough, and his microscopical sections would do credit to any one possessing the most elaborate apparatus, while his interpretation of pathological findings was also sound. His interest in the science of medicine never flagged; widely read, a truly cultured and unassuming colleague, Dr. Major's death is a loss not only to the medical profession but to all with whom he came in contact.

WE regret to announce the death at Sheffield, after a long illness, of Dr. THOMAS BERNARD STEDMAN. Dr. Stedman received his medical education at University College Hospital, where he was medallist in medicine and midwifery, and he graduated M.B.Lond. (with honours) in 1893, obtaining the diplomas of M.R.C.S.Eng. and L.R.C.P.Lond. in the same year; in 1895 he graduated M.D.Lond. Subsequently he took the diploma in Public Health of Cambridge, and he studied for the Bar at the Middle Temple and was duly called. For two years he was house-surgeon at Sheffield Royal Hospital, and for a time he assisted his father in general practice at Leighton Buzzard, while later he was deputy coroner for North-East London. During the war he held a commission in the R.A.M.C., and afterwards was attracted again to Sheffield, where he practised until his last illness. He acted also as honorary demonstrator in toxicology at the University of Leeds. Dr. Stedman had a very keen sense of public duty, and his only recreation was his work. To a large circle of patients he was a true friend as well as a physician, and he worked devotedly among the poor. He is survived by his widow and one daughter.

DR. ERNEST DUPRÉ, professor of mental diseases in the Paris Faculty of Medicine and a well known writer on psychiatry, died recently. Scientific nomenclature is indebted to him for numerous neologisms, of which the best known are "meningism" and "mythomania."

The Services.

MINISTRY OF PENSIONS: INFORMATION FOR OFFICERS, WIDOWS, AND OTHERS.

IN accordance with the advice of the Departmental Committee, whose report on the administration of the Ministry of Pensions was recently published, the Minister of Pensions has taken steps to make more widely known the benefits available to disabled officers and nurses and the relatives of those deceased. With this object a new series of leaflets (officially described as "M.P.O. Leaflets") is being issued, dealing with the following matters:

1. General information for disabled officers.
2. Provision for disabled nurses.
3. Medical treatment of disabled officers and nurses.
4. Supply, renewal, and repair of surgical and artificial appliances (other than artificial limbs).
5. Alternative retired pay.
6. Pensions and allowances to widows and other relatives of deceased officers.
7. Supply of artificial limbs (in preparation).
8. Special Grants Committee's arrangements for officers and nurses and their dependants.

Copies of No. 1 can be obtained by those interested on application to the Secretary, Officers' Branch, Ministry of Pensions, Cromwell House Annexe, Millbank, S.W.1, or from Officers' Friends in the Regions, or from any Local War Pensions Committee. The other leaflets, dealing with special aspects, can be obtained on application to the following: for Nos. 2, 5, and 6 to the Officers' Branch (as above); for Nos. 3, 4, and (later) 7, to the Commissioner of Medical Services at any of the regional offices of the Ministry—namely, Burton Court, Chelsea, London, S.W.3; Edinburgh, Newcastle-on-Tyne, Manchester, Leeds, Cardiff, Birmingham, Nottingham, Bristol, Belfast, or Dublin; and for No. 8 to the Special Grants Committee (Officers), Thorney House, Smith Square, London, S.W.1.

WALTER BUCHANAN SCHOLARSHIP AT EPSOM COLLEGE.

THE Council will shortly award a Sir Walter Buchanan Scholarship at Epsom College, the value of which is about £33 a year. The rule fixed by the founders of the scholarship is as follows:

"The Sir Walter Buchanan Scholarship is primarily intended for the sons of deceased or prematurely invalided officers of the Indian Medical Service, or, failing any such candidates, for the sons of legally qualified medical men of pure British parentage in necessitous circumstances who have practised medicine for at least five years in India."

Applications should be sent to the Secretary, Mr. J. B. Lamb, 49, Bedford Square, W.C.1.

Universities and Colleges.

UNIVERSITY OF LONDON.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.

THE following entrance scholarships have been awarded for the sessions 1921–22:

University Scholarships of 50 guineas each: N. F. Adeney, W. R. H. Pooler. *University Exhibition of 30 guineas:* G. B. Woodd Walker. *Entrance Scholarships in Natural Science, £100:* B. W. Goldstone; *£50,* M. Odess. *Palmer Scholarship, £25:* E. I. Puddy. *Epsom College Scholarship* (by nomination): G. E. G. Peirce.

AT the Dorset County Hospital, Dorchester, on September 21st, there were opened the new pathological department and *x* ray and electrical rooms. Lord Ellenborough, chairman of the hospital committee, presided, and Mr. James Sherren, C.B.E., surgeon to the London Hospital—himself a Dorset man—gave an interesting address on "The value of pathological and *x*-ray examinations in abdominal surgery." He pointed out that by the institution of the new departments—which might seem only a side-show to the general public, but to the medical staff were the very centre of the hospital's being—the Dorset County Hospital was placing itself in the position of being able to make the fullest use of modern medical knowledge. He himself was particularly interested in abdominal surgery, and with that aspect of medicine he dealt in his address, but the new departments would be of at least as great value in all the other different branches of medicine. Mr. Sherren's address was not only interesting to his medical colleagues, but had the effect of stimulating the interest of the members of the lay public who attended the function. After his address the new departments were opened for inspection by the assembly.

Medical News.

SIR HAROLD STILES, Regius professor of clinical surgery in the University of Edinburgh, will deliver the fellowship address at the Convocation of the American College of Surgeons, Philadelphia, on October 28th. He sailed for New York on September 24th.

THE autumn session at the Post-Graduate College, West London Hospital, Hammersmith, will open on Monday, October 10th.

THE London Medical Exhibition will be held at the Central Hall, Westminster, from Monday, October 3rd, till Friday, October 7th, from noon to 6.30 p.m.

THE foundation stone of Queen Mary's Maternity Home at Upper Heath, Hampstead, will be laid by Her Majesty the Queen on Wednesday, October 12th, at 3 p.m.

THE centenary of the foundation of the National University of Buenos Aires was celebrated on August 11th.

DR. EVAN POWELL, on the occasion of his retirement from the office of medical superintendent of the City Asylum, Mapperley Hill, Nottingham, after forty-one years' service, has received a presentation from the Asylum Committee.

LIEUT.-COLONEL SIR DAVID PRAIN, C.M.G., C.I.E., F.R.S., will deliver the inaugural address before the Pharmaceutical Society of Great Britain at the opening of the eightieth session of the School of Pharmacy on Wednesday, October 5th, at 3 p.m., when he will also present the Pereira medal.

THE negotiations for the absorption of the Royal Chest Hospital by the Great Northern Central Hospital, Holloway, having been completed and formal agreements entered into, the Committee of the latter institution are, by an order of the Charity Commissioners, responsible for the management of the Royal Chest Hospital as from September 6th, 1921.

A DISCUSSION on plumbing and sanitation on board ship will be held by the Royal Sanitary Institute, at 90, Buckingham Palace Road, S.W.1, on Wednesday, October 12th. The chair will be taken at 4 p.m. by Sir Henry Tanner, C.B.

AT the meeting of the Medical Officers of Schools Association, to be held at 11, Chandos Street, Cavendish Square, W.1, on Friday, October 21st, at 4.45 p.m., a discussion on games for girls will be opened by Dr. Alice E. Sanderson Clow, medical inspector, Cheltenham Ladies' College, and Miss M. Stansfeld, principal, Bedford Physical Training College.

AT the Italian Congress for the Protection of Infancy, to be held in Rome on October 20th to 22nd, the following subjects will be discussed: (1) Pre-natal prophylaxis, by Dr. Artom of Rome; (2) antituberculosis prophylaxis in infancy, by Professor Caronia of Naples; (3) gastro-intestinal prophylaxis in infancy, by Professors Gutierrez and Albertini of Milan.

BY arrangement with the Government Disposal Board the Joint Council of the Order of St. John and British Red Cross Society are conducting by private treaty a sale of medical and surgical stores and equipment. All articles have marked prices and can be inspected in London. The sale closes on October 31st, after which date other arrangements will be made for disposal of the goods remaining in store. Catalogues and permits to view may be had from the Director of Hospital Services, 19, Berkeley Street, London, W.1. An advertisement on the subject appears in the JOURNAL of this week (page 9).

IT is reported that a company called the Imperial and Foreign Corporation of London has entered into an agreement with the Czecho-Slovakian Government to supply the capital necessary for the working of the famous Joachimsthal mines, near Carlsbad; the Corporation is to have half the radium salt annually produced, which, it is estimated, averages four grams. Professor Soddy of Oxford arrived in London with two grams for the Corporation on September 25th. It is stated that the radium salt will be rented and the emanation sold for therapeutic purposes.

DR. A. H. MACKLIN, O.B.E., M.C., is surgeon to the Antarctic Expedition which left the Thames on September 17th in the *Quest*. He accompanied Sir Ernest Shackleton on his last South Polar Expedition in 1914, and served afterwards in the R.A.M.C., attaining the rank of Major. He studied medicine at Manchester, graduating M.B., Ch.B.Vict. in 1912. He is the son of Dr. T. T. Macklin, now of Lancaster.

ON the occasion of his leaving Bottesford (Lincolnshire for Rotherham Dr. T. T. Kelly was presented, on September 9th, with a silver tea service and other gifts in appreciation of his services by the inhabitants of Bottesford and the surrounding villages.

A VACATION course on medical radiology will be held from October 9th to 23rd, at the Hospital St. Antoine, Paris, under the direction of Dr. A. Béclère. The fee is 150 francs; further information may be had from the director of the laboratory, Dr. Solomon.

THE fifth annual meeting of the National Society for the Promotion of Occupational Therapy (U.S.A.) will be held from October 20th to 22nd, in Baltimore, under the presidency of Dr. Herbert J. Hall.

FOUR cases of small-pox have been reported in Nottingham during the first three days of this week.

THE general work of University College, London, will begin on October 5th. The lectures on the history of science will be resumed on Monday, October 10th, at 5 p.m., when Professor Elliot Smith will give the first of three lectures on the beginnings of science. Dr. A. Wolf will begin a series of lectures on the general history and development of science at 3 p.m. on October 12th; they will be continued on succeeding Wednesdays at the same hour. On October 14th Dr. J. C. Drummond will begin a course of eight public lectures on nutrition.

ACCORDING to the *Journal of the American Medical Association*, a number of medical men from the United States have gone to Vienna for post-graduate study, and the old American Medical Association of Vienna has been revived.

THE annual conference of the Chartered Society of Massage and Medical Gymnastics will be held in London on October 6th, 7th, and 8th. The programme includes lectures by Sir James Purves Stewart, Dr. Arthur F. Hurst, Sir Henry Gauvain, Dr. J. B. Mennell, and Dr. H. Crichton Miller. There will also be a number of demonstrations and a visit to the massage department of Guy's Hospital. Communications should be addressed to the Secretary of the Society, 157, Great Portland Street, W.1.

ON September 17th Professor Tuffier of Paris delivered the inaugural address at the opening of the Medical College of the University of Peking on the subject of surgical septicaemias and their treatment; on the three following afternoons he held special surgical clinics.

A SPECIAL course of instruction in venereal diseases for post-graduates and students will be held during October and November at the London Lock Hospitals (the female hospital and women's out-patient department is at 283, Harrow Road, W., and the male hospital and out-patient department at 91, Dean Street, W.). The course will consist of clinical instruction in diagnosis and treatment, which will be given daily at both hospitals, and of twenty-six special lectures. Applications for tickets should be made to the secretary at 283, Harrow Road, W.9. The fee for the complete course is four guineas; and the fee for one month's instruction in venereal pathology, including practical work, is three guineas, which can be commenced any time during the year. Post-graduates who are members of the Fellowship of Medicine will be admitted free to the lectures only.

THE annual dinner of the Society of Medical Officers of Health will be held at the Café Royal, Regent Street, W., on Friday, October 21st, at 7.30 p.m. Amongst those who have already accepted invitations are the Minister of Health, the Attorney-General, the Bishop of London, Sir Norman Moore, P.R.C.P., Sir Anthony Bowlby, P.R.C.S., Sir George Newman, M.D., and Sir Philip Magnus, M.P. Ladies are invited, and early application for tickets (stating names of guests) should be made to the Executive Secretary at 1, Upper Montague Street, Russell Square, W.C.1. A remittance of 12s. 6d. for each ticket should be sent with applications before October 14th, after which date the charge will be 15s.

ACCORDING to the *Japan Medical World*, the plague situation throughout Manchuria is improving, but in some places more quickly than in others. The International Plague Committee of Harbin, which consists of representatives of the railway, Chinese officials, various consuls, merchants, and medical men, and has been sitting weekly since December, 1920, has decided to hold fortnightly meetings in future. Plague is, however, still spreading in Vladivostok and the neighbouring villages because of the lack of proper precautionary measures. According to a Japanese medical expert recently sent there to make inspection, fifty new cases are being reported almost every day.

CASES of bubonic plague have been discovered in Queensland and the state has been proclaimed infected by the Federal Government; the first case appears to have occurred at Brisbane towards the end of July, and the fact, it is stated, was concealed. A case occurred at Townsville on September 22nd. Infected rats have been found at Brisbane, but only, according to the *Times* correspondent, eleven out of 3,000 killed. A later report, however, is to the effect that a steamer arriving at Sydney from Brisbane had eleven infected rats on board.

A SCHOOL of radiography for the training of technical assistants has been instituted at King's College Hospital, London, under the direction of Dr. Robert Knox, honorary radiologist to the hospital. The school is open to both men and women, and carries out a course of instruction in radiography, radiotherapy, and electrotherapy for a period of one year preparatory to the examination of the Radiographers' Society. The course includes instruction in general elementary physics (sound, heat, light, etc.), electricity, with the construction of electrical apparatus, practical radiotherapy, treatment, methods of dosage, diathermy, high frequency, and radium; anatomy, with elementary morphology; and photographic chemistry, with practical and clinical photography. An applicant for admission to a course must have attained the age of 18 years, and no applicant can be accepted without an interview. The fee for the full course is thirty-five guineas, but applicants who have obtained a nursing certificate at King's College will be admitted at two-thirds of the fee. Inquiries should be addressed to the Radiographer, King's College Hospital, Denmark Hill, S.E.5, and marked "School of Radiography."

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.

2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.

3. MEDICAL SECRETARY, *Mediscra, Westrand, London;* telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin:* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361, Central).

QUERIES AND ANSWERS.

INCOME TAX.

"G. A. C." bought his partner's share in April, 1918. Since that date the assessments to income tax have been (1) on "G. A. C." on the basis of his cash receipts, including his share of the old partnership payments, and (2) on his former partner on the amount of his share of the old debts. Our correspondent asks if this is correct.

*** The person to be assessed is the one carrying on the practice, and "G. A. C.'s" partner appears to be under no obligation to pay tax on the old debts or any portion thereof. Tax is payable for the earnings of any particular financial year, and the cash receipts are brought into the computation—instead of the book debts—only because of the difficulty of recording and valuing professional debts. As from April, 1918, onwards "G. A. C." is chargeable for the whole of the profits of the practice, measured either in book debts properly valued or, as a matter of convenience, by the whole of the cash receipts.

"COMPLEX" retired from a partnership on June 30th, 1920, and inquires as to the existence of any liability for payments received since.

*** Our correspondent was liable to tax on one-fourth only of his share of the assessment for 1920-21, because for three-quarters of that year he ceased to earn an "income." It is to be presumed that he has paid tax on the full income of the past, measured for convenience by the cash receipts of each year instead of by the value of the year's bookings. He cannot legally be assessed at all for 1921-22, because there is no source of "income" to be assessed. If "Complex" prefers to deal with the matter through an agent he cannot do better than consult a chartered accountant.

LETTERS, NOTES, ETC.

MENINGOCELE IN THE NEWBORN.

DR. T. F. FORSTER (Dalton-in-Furness) writes: On September 11th last I was called to attend a young woman, aged 24, in her first confinement. On examination I came across what at first seemed to be an extremely thick bag of membranes, but owing to the exceeding thickness this diagnosis was evidently incorrect. On further examination I found that this bag was adherent to the skull, the edges of the sutures of which could be easily detected. I came to the conclusion that I was dealing with a case of meningocele. On the bag coming to the vaginal orifice this diagnosis was confirmed by finding the hair on the scalp. The confinement was uneventful. When the child was born it had evidently been dead for some weeks. This somewhat rare condition should be kept in mind should similar cases be met with. The meningocele was protruding from the anterior fontanelle.

MEDICAL ASPECTS OF GOLF.

"D.P.H." writes from St. Andrews to make two suggestions which, though not novel, cannot perhaps be too often repeated. The first is that the player who finds it difficult to keep his eye on the ball should have his refraction tested. The second is not to overtire or strain the muscles controlling the wrist and to look for any sign of inflammation about the wrist. In support of his opinion that the left wrist in particular should be watched, he quotes James Braid's opinion in his book (Spalding Series): "The whole grip must be firm and such as to ensure a complete command over the club in every respect; . . . in the upward swing of the club . . . the first movement must come from the wrists, and it is the left one which makes the initiative."

ENUCLEATION OF THE TONSILS.

"CLINIC" writes: Mr. Hovell says: "Remove 'diseased' tonsils only; do not remove 'merely enlarged' ones"! I inquire how to discriminate in children. Mr. Gilbert Chubb (July 23rd, p. 130) says such an inquiry shows a lack of appreciation of the gravity of local sepsis. The deduction is bewildering but not helpful. Mr. Chubb states that we should stop all haemorrhages at the time of operation. The point is, thousands of tonsillectomies are done yearly without any attempt being made to arrest the haemorrhage at all. It is expected to stop. When it does not, the fact is recognized by the child showing symptoms of loss of blood. The excuse for this method is held to be want of equipment and lack of beds. Local authorities will speedily produce both as soon as hospital throat surgeons cease to acquiesce collectively in a procedure they individually condemn.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medica colleges, and of vacant resident and other appointments at hospitals, will be found at pages 37, 40, 41, 42, 43, and 44 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 38, 39, and 40.

THE appointment of certifying factory surgeon at Bradford, West (York, West Riding), is vacant.

THE Secretary of State for the Home Department proposes to appoint a second medical referee under the Workmen's Compensation Act, 1906, resident preferably in West Norfolk, for the Attleborough, Ayisham, Downham Market, East Dereham, Fakenham, Holt, King's Lynn, North Walsham, Norwich, Swaffham, The ford, and Wymondham County Courts, in Circuit No. 32. Applications to the Private Secretary, Home Office, by October 19th.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line	0	1	6
Whole single column (three columns to page)	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.